SONY

VIDEOCASSETTE RECORDER

BVW-55

BETACAM SP

MAINTENANCE MANUAL Part 2

Volume 1 1st Edition

Serial No. 10001 and Higher

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

設置や保守，点検，修理などを行う前に，別冊のメンテナンスマニュアルPart 1の「安全のために」と別冊のオペレーションマニュアルの「安全のために」を必ずお読みください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Vorsicht!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

For the customers in the U.S.A. and Canada

RECYCLING NICKEL-CADMIUM BATTERIES

Nickel Cadmium batteries are recyclable. You can help preserve our environment by returning your unwanted batteries to your nearest point for collection, recycling or proper disposal.
Note: In some areas the disposal of nickel cadmium batteries in household or business trash may be prohibited.

RBRC (Rechargeable Battery Recycling Corporation) advises you about spent battery collection by the following phone number.

Call toll free number: 1-800-822-8837
(United States and Canada only)

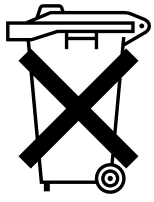
Caution: Do not handle damaged or leaking nickel-cadmium batteries.

Voor de klanten in Nederland

Dit apparaat bevat een $(CF)_n$-Li batterij voor memory back-up.

Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat bij einde levensduur afdankt.

Gooi de batterij niet weg. maar lever hem in als KCA.



Bij dit produkt zijn batterijen geleverd. Wanneer deze leeg zijn, moet u ze niet weggooien maar inleveren als KCA.

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(Will be avaelable as a supplement.)

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(Will be avaelable as a supplement.)

Manual Structure

Purpose of this manual

This manual is the maintenance manual part 2 volume 1 of videocassette recorder BVW-55.

This maintenance manual part 2 (Volume 1 and Volume 2) is intended for use by trained system and service engineers, and provides the information that premises the parts level service (parts replacement, guideline for adjustment, schematic diagrams, board layouts, detailed parts list) .

This manual (volume 1) explains about parts replacement and guideline for adjustment.

Related manuals

Besides this “Maintenance manual part 2”, the following manuals are available for videocassette recorder BVW-55.

- **Operation Manual (supplied with the BVW-55)**
  This manual is necessary for application and operation of the BVW-55.

- **Maintenance Manual Part 1 (supplied with the BVW-55)**
  This manual describes the setting and maintenance information.

- **Protocol Manual of Remote (9-pin) Connector (available on request)**
  This manual explains the protocol for controlling the VTR via the RS-422A (9-pin serial remote) . If this manual is required, please contact to Sony’s service organization.

- **BKNW-225 Maintenance Manual (supplied with the BKNW-225)**
  This manual describes the spare parts list and the exploded view for the service parts of the docking kit BKNW-225, that is used when the two BVWs are coupled.

Contents

This manual is organized by following sections.

Maintenance manual part 2 volume 1 (9-967-828-)

Section 1 Service Overview
Explains the service information (the removal of PLCC IC, board extension, NV-RAM, and so on) for this manual (volume 1).

Section 2 Maintenance Mode
Explains menus of the maintenance mode for adjustment.

Section 3 Replacement of Periodic Maintenance Parts
Explains the replacement of periodic maintenance parts and overview for replacement of mechanical parts.

Section 4 Main Parts Replacement
Explains the replacement of mechanical parts (except periodic maintenance parts) and circuit boards.

Section 5 Tape Path Alignment
Explains the tape path alignment after replacement of parts that are described in Section 3 and Section 4.

Section 6 Electrical Alignment after Replacement of Periodic Maintenance Parts
Explains the electrical alignment associated with replacement of parts that are described in Section 3.

Section 7 Electrical Alignment
Explains the electrical alignment for the maintenance of this unit.

Maintenance manual part 2 volume 2 (9-967-829-)

Section 1 Spare Parts
Describes the exploded views, the mechanical parts list and the electrical parts list.

Section 2 Semiconductor Pin Assignments
Describes the semiconductor pin assignments.

Section 3 Block Diagrams
Describes the block diagrams of overall and each board.

Section 4 Schematic Diagrams and Frame Wiring
Describes the frame wiring and the schematic diagrams.

Section 5 Board Layouts
Describes the board layouts of printed wiring boards.

Section 1
Service Overview

1-1. Board Extension

1-1-1. Plug-in Board

Extend the plug-in board using the extension board EX-706 (option) when it is checked and adjusted.

Extension board	Part No.	Connected plug-in boards
EX-706	A-8321-000-A	AFM-16, APR-42, AU-262, DEC-97, MD-122, RP-107, SDI-23, SY-272
		TG-191, VPR-59

Do not extend when the RP-107 board is adjusted. At this time, remove the RP shield plate.
The RP-107 board differs in an extension method. Therefore refer to “1-1-2. RP-107 Board” when the RP-107 board is extended to check.

Extension

Note

- Be sure to turn off the power when removing and installing the board. To turn off the power, be sure to disconnect the cable connected at the DC IN connector or the battery, in addition to turning off the power switch.

1. Remove the plug-in board to be checked and adjusted. (For the removal of the plug-in board, refer to “1-8-1. Plug-in Board” of the maintenance manual Part1.)
2. Connect the connectors on the extension board EX-706 to the connectors on the mother board.
   Note
   Install the extension board EX-706 with side A in the front.
3. Connect the connectors on the plug-in board to the connectors on the extension board EX-706.

1-1-2. RP-107 Board

Required Tool

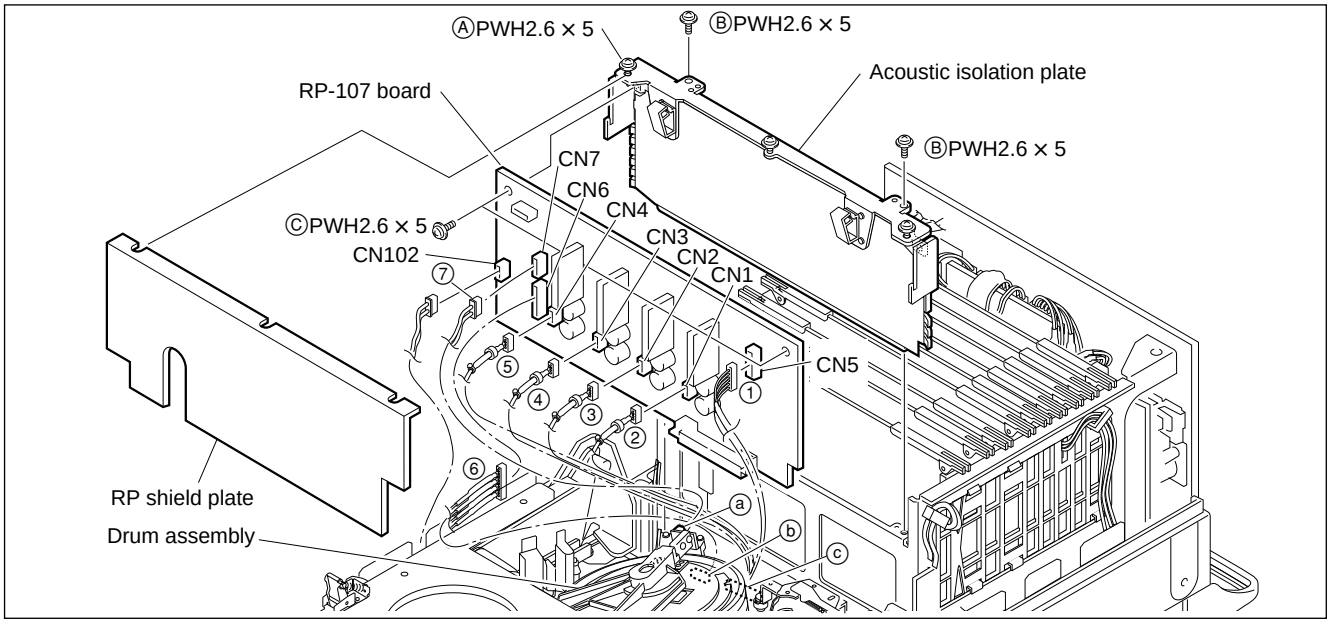
Extension harness (SR66-EQ3): 1-958-196-14
Extension harness (DR1): 1-959-894-11
Extension harness (DR2): 1-959-895-11

Extension

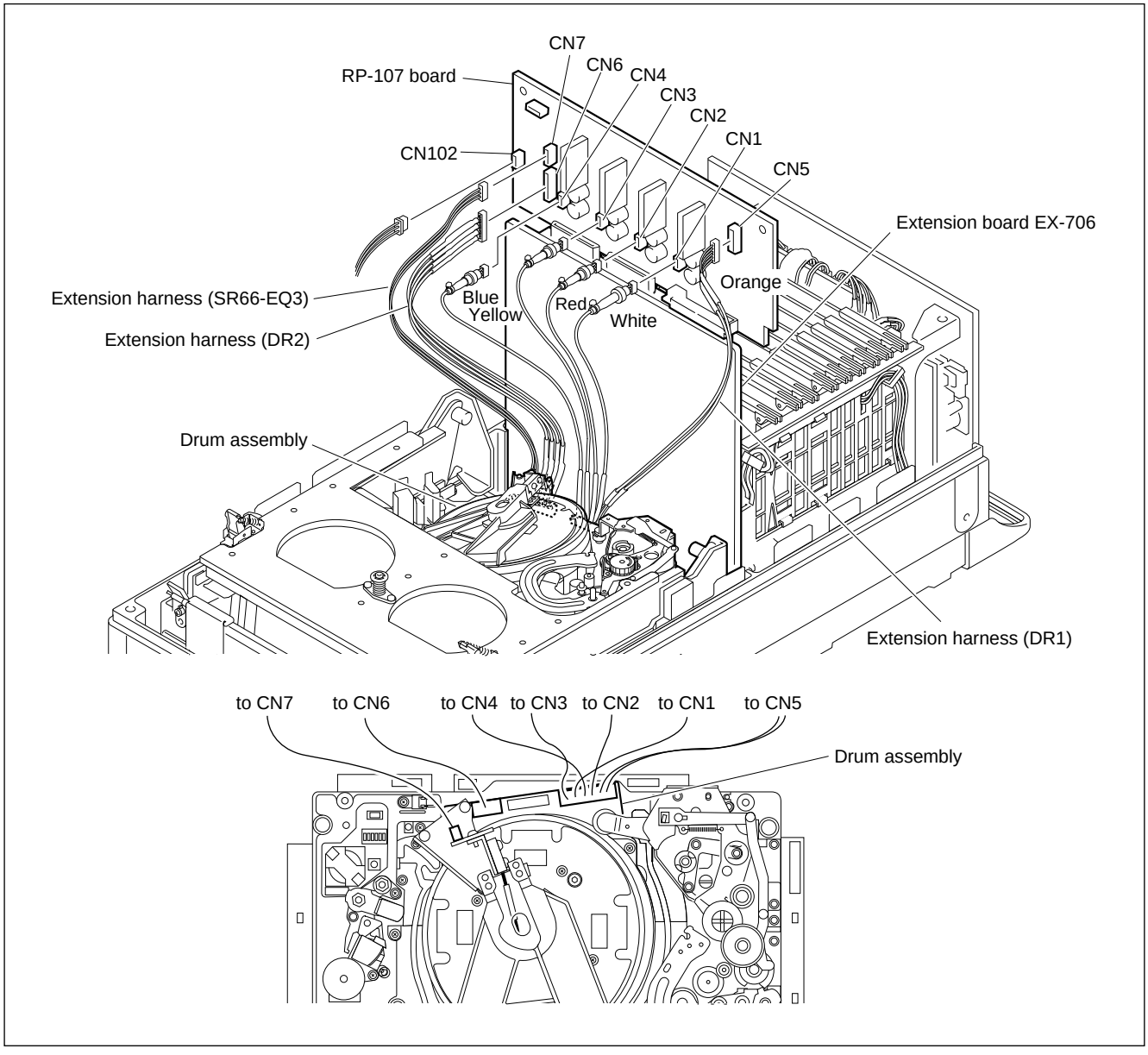
Note

Be sure to turn off the power when removing and installing the board. To turn off the power, be sure to disconnect the cable connected at the DC IN connector or the battery, in addition to turning off the power switch.

1. Remove the RP-107 board.
   (1) Remove the upper frame. (For the removal, refer to "1-6. Removal/Installation of Cabinet" of the maintenance manual Part1.)
   (2) Loosen the three screws (ⒶPWH2.6 × 5) and remove the RP shield plate.
   (3) Disconnect the harness from CN102 on the RP-107 board.
   Note
   This harness is fixed to the DM-121 board using the clamp. It is not necessary to disconnect the harness from CN102 when the harness has removed from the clamp.
   (4) Unscrew the two screws (ⒷPWH2.6 × 5).
   (5) Lift the RP-107 board together with the acoustic isolation plate approx.1 cm and disconnect the RP-107 board from the connectors on the mother board.
   (6) Disconnect the harnesses from the seven connectors on the RP-107 board.
   Note
   It is recommended to disconnect in the order presented by ① to ⑦ in the figure.
   (7) Lift the RP-107 board together with acoustic isolation plate and remove them.
   (8) Unscrew the two screws and remove the RP-107 board from the acoustic isolation plate.
2. Remove the harnesses from the three connectors (ⓐ, ⓑ, ⓒ) on the drum assembly using a thin stick with a no sharp point.



3. Connect the three extension harnesses to the drum assembly.
4. Connect the connectors of the extension board EX-706 to the connectors of the mother board.
5. Connect the connectors of the RP-107 board to the connectors of the extension board EX-706.
6. Connect the extension harnesses to the RP-107 board.

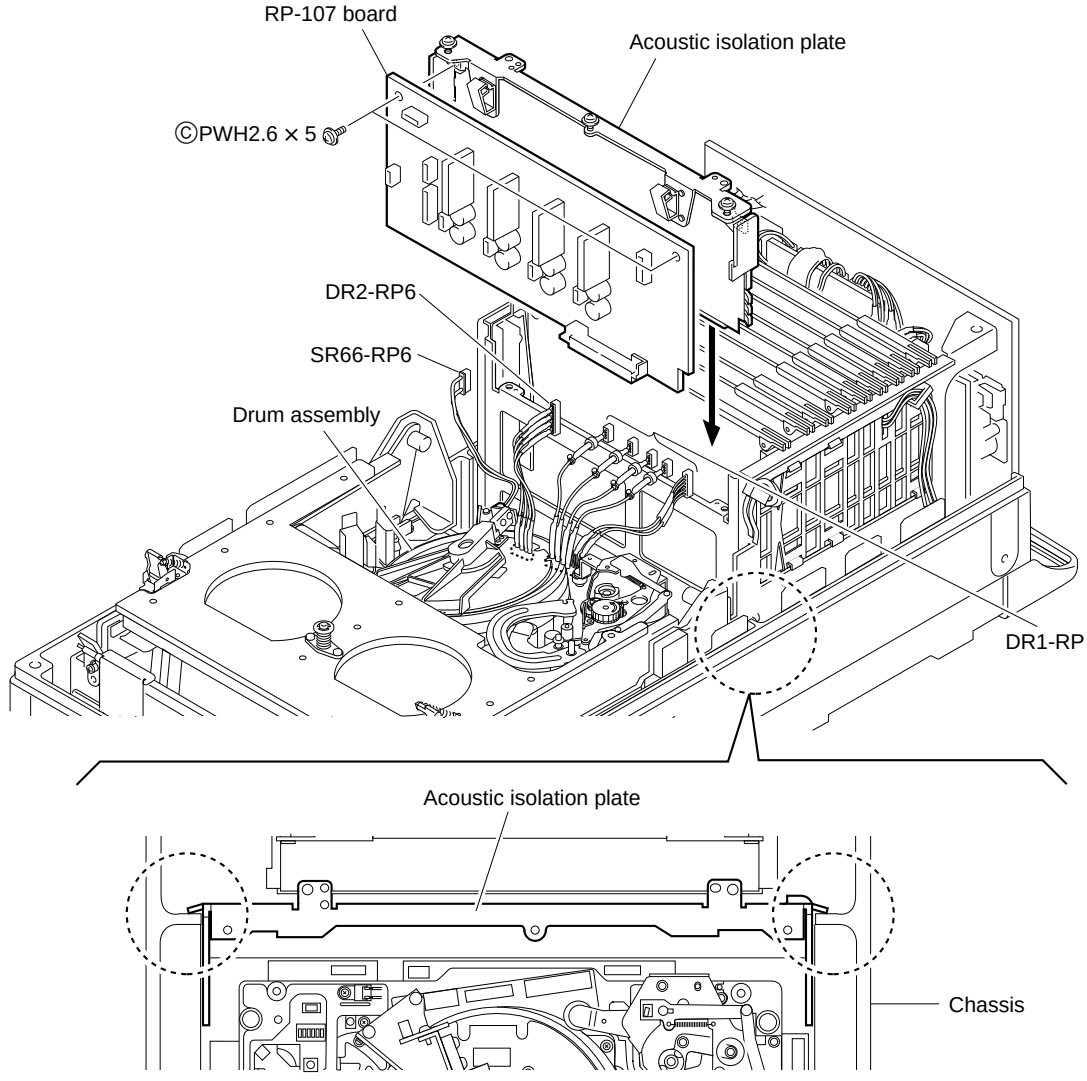


Installation

1. Remove the RP-107 board, extension board and extension harnesses in the reverse order of steps 3 to 6 in “Extension”.
2. Temporarily attach the RP-107 board to the acoustic isolation plate with the two screws (ⓒPWH2.6 × 5).
3. Connect the three harnesses (DR1-RP, DR2-RP6 and SR66-RP6) to the drum assembly.
4. Lightly insert the RP-107 board. At this time, insert the acoustic isolation plate into the position shown in the figure.

   Note

   Take care not to catch the harnesses between the acoustic isolation plate and the chassis.



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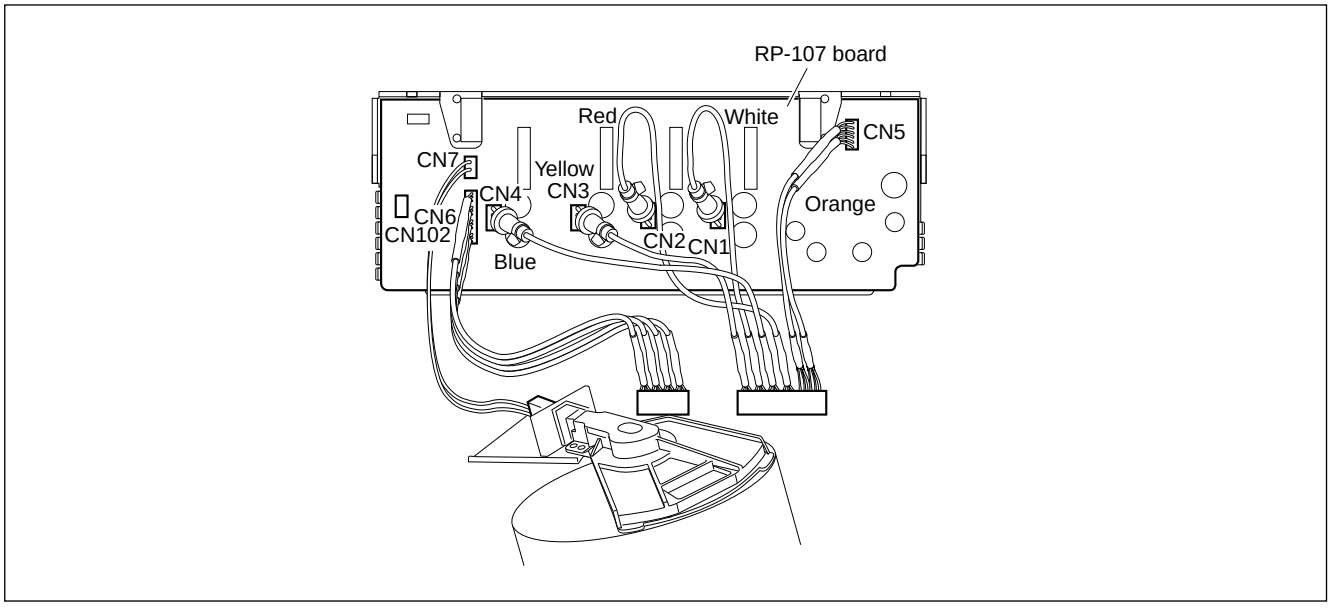
5. Connect the harnesses (DR1-RP, DR2-RP6 and DR66-RP6) to the connectors (CN1 to CN4, CN6 and CN7) on the RP-107 board.

Note

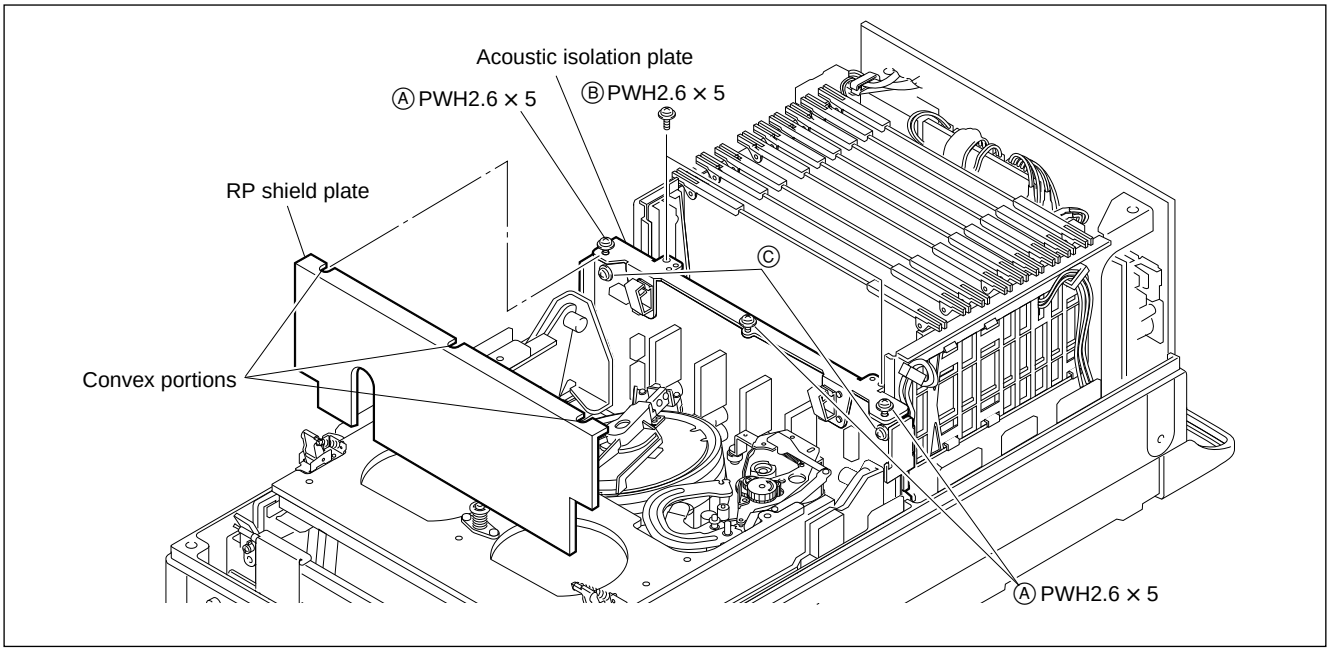
Connect the harnesses referring to the figure below. (Make the white and red harnesses upright and the blue and yellow harnesses lay)

If not, it is impossible to make full use of this unit's properties.

6. Securely connect the RP-107 board to the connectors on the mother board.
7. Connect the harnesses to CN5 and CN102 on the RP-107 board.



8. Fix the acoustic isolation plate to the chassis with two screws (ⒷPWH2.6 × 5).
9. Tighten the screws ⓒ and securely attach the RP-107 board to the acoustic isolation plate.
10. Attach the RP shield plate as to putting the convex portion of the RP shield plate into the clearance between screws and acoustic isolation plate, then fix with screws (ⒶPWH2.6 × 5).
11. Attach the upper frame. (For the installation, refer to "1-6. Removal/Installation of Cabinet" of the maintenance manual Part 1.)



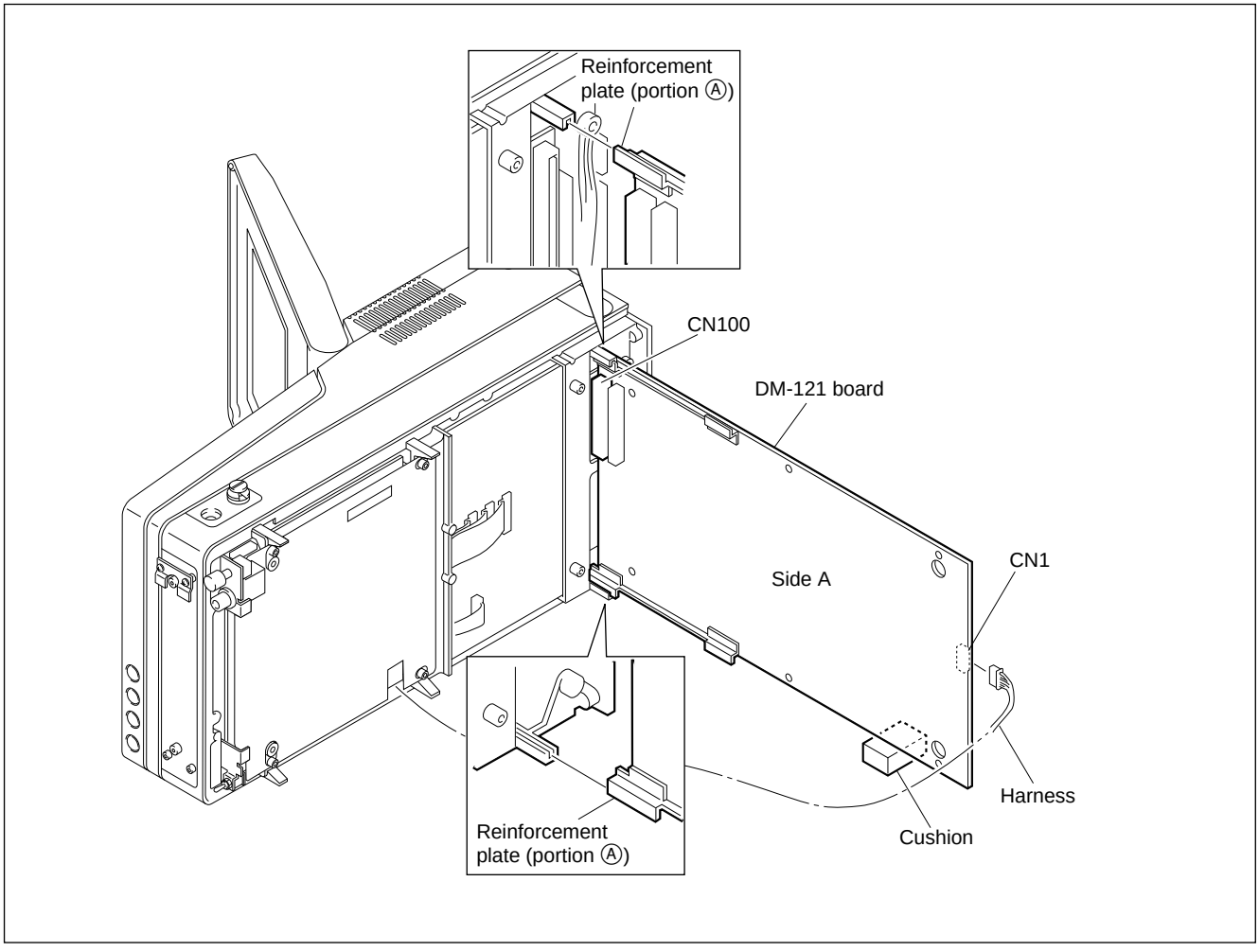
1-1-3. DM-121 Board

Extension

Note

Be sure to turn off the power when removing and installing the board. To turn off the power, be sure to disconnect the cable connected at the DC IN connector or the battery, in addition to turning off the power switch.

1. Remove the DM-121 board. (For the removal, refer to “1-8-2. DM-121 board” of the maintenance manual Part1.)
2. Connect the connector (CN100) while inserting portions Ⓐ of reinforcement plates on the DM-121 board into the foot grooves of the unit.
3. Connect the harness connecting between the RP-107 and DM-121 boards to the connector (CN1).
4. Place the cushion between the DM-121 board and floor to fix the DM-121 board.



1-2. Fixtures and Adjustment Equipment List

1-2-1. Equipment for Adjustment

It is recommended to use the equipment listed below or the equivalents.
Each equipment is available as standard products.

Equipment	Model name	Remarks	Description ∗1
Serial digital component video signal generator	Tektronix TSG-422-OP.1S	for generating 4:2:2 format digital signal	P2
Analog composite video signal generator	Tektronix TSG-170A	for 525/60 system	P2
Serial digital component monitor	Tektronix WFM601		P2
Analog composite waveform / vector monitor	Tektronix 1750 or 1780R	for measuring analog composite signal for 525/60 system	P2
	Tektronix 1751 or 1781R	for measuring analog composite signal for 625/50 system	
Oscilloscope	Tektronix 2465B		P2
Analog component waveform monitor	Tektronix WFM300	for video phase adjustment	P2
Spectrum analyzer	Advantest R3261A	with external trigger function bandwidth: more than 100 MHz	P2
Network analyzer	Anritsu MS420B		P2
Audio signal generator	Tektronix SG505-OP.02		P2
Audio analyzer	Tektronix AA501A-OP.02	for measuring distortion and levels	P2
Audio level meter	Hewlett-Packard HP3400A		P2
Digital voltmeter	Advantest TR6845		P2
Composite video monitor	Sony BVM-14F5U or BVM-14F5E ∗2 OP. BKM-24N OP. BKM-25P	 for 525/60 system for 625/50 system	P2
Terminator	75 Ω BNC type		P2
Recording tape	Sony Betacam SP tape (BCT-30MA, etc.)		P2
	Sony Betacam tape (BCT-20G, etc.)		P2

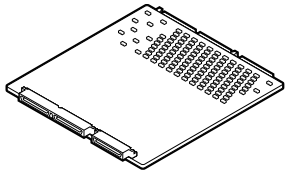
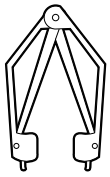
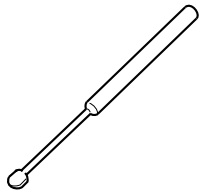
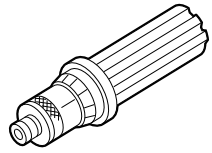
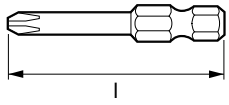
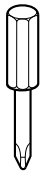
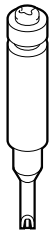
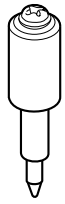
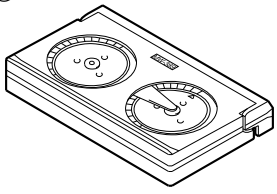
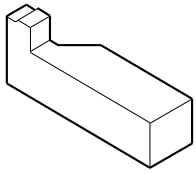
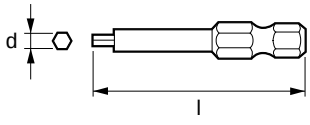
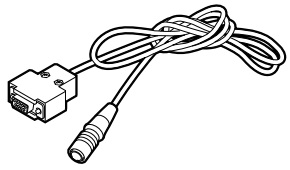
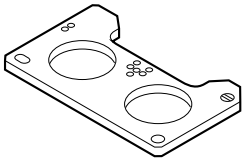
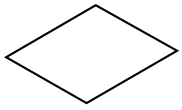
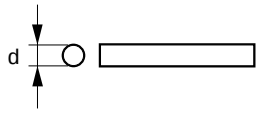
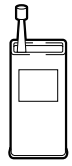
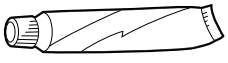
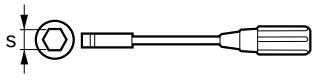
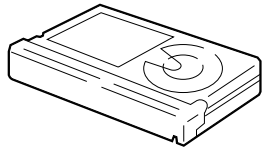
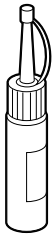
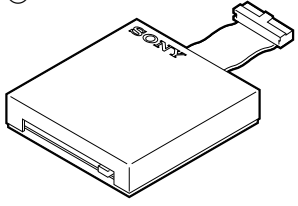
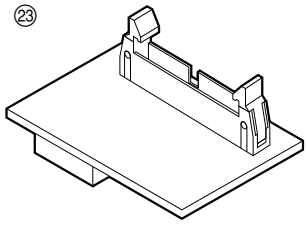
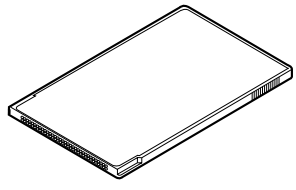
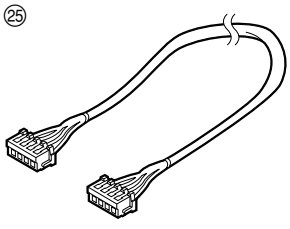
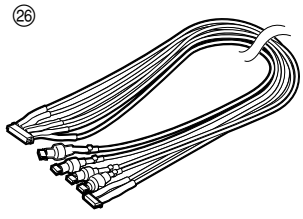
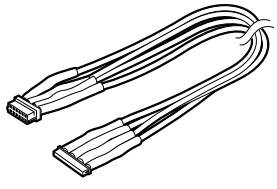
∗1: P2= Used in the maintenance manual Part 2.
∗2: Use the composite video monitor that is applicable to the places in the world.

1-2-2. Fixtures

Fig.	Part No.	Name	For use	Description*
1	A-8321-000A	Extension board (EX-706)	Extension of plug-in boards	P2
2	J-6035-070-A	Extruction tool (for PLCC socket)	Extruction of PLCC IC	P2
3	J-6080-840-A	Inspection mirror	Tape curl check	P2
4	J-6252-520-A	Torque screwdriver (12 kgf•cm) (1.2 N•m) [JB-5252]	Tightening screws of cabinet for installing and removing	P1/P2
	J-6325-400-A	Torque screwdriver (3 kgf•cm)	Tightening screws (for M1.4 and M2 bit)	P1/P2
5	J-6325-110-A	Torque screwdriver bit (for M1.4)	Tightening screws on mech. deck (l = 75 mm)	P1/P2
6	J-6325-380-A	Torque screwdriver bit (for M2)	Tightening screws on drum, capstan, reel motor and boards (l = 162 mm)	P1/P2
7	J-6322-420-A	Tape guide adjustment driver (45)	Tape path adjustment	P2
8	J-6323-530-A	Stop washer fastening tool	Installation of stop washer	P2
9	J-6323-890-A	Torque cassette (FWD BACK TEN.) [MW-389]	FWD back tension REV back tension measurement	P2
10	J-6324-150-A	Reel table height adjustment tool [MW-415]	Reel height check	P2
11	J-6326-120-A	Hexagon bit (for torque driver)	Tightening screws on mechanical deck for installing and removing (d = 1.5 mm, l = 85 mm)	P2
12	J-6530-380-A	Conversion cable, 6P - 9P	Rewrite internal software	P2
13	J-7032-610-B	Cassette reference plate	Reel height adjustment	P2
14	3-184-527-01	Cleaning cloth (15 cm × 15 cm)	Cleaning	P1/P2
15	3-649-266-01	Parallel pin (d = 1.6 mm)	Fixing position of cam gear	P2
	3-703-358-04	Parallel pin (d = 2.0 mm)	Fixing position of threading gear/drawing arm when installing	P2
16	7-432-114-11	Screw locking compound (200g)	Inhibits loosening of screws	P2
17	7-651-000-10	Sony grease SGL-601 (50 g)		P2
	7-651-000-11	Sony grease SGL-801 (50 g)		P1/P2
18	7-661-018-18	Diamond oil NT-68 (50 ml)		P2
19	7-700-751-01	Nut driver (s = 4.5 mm)	CTL/AT head height adjustment	P2
20	8-960-096-01	Alignment tape, CR2-1B	Tracking alignment	P2
	8-960-096-41	Alignment tape, CR5-1B (METAL)	Video alignment	P2
	8-960-097-44	Alignment tape, CR5-2A (OXIDE)	Betacam video alignment	P2
	8-960-097-45	Alignment tape, CR8-1A (OXIDE)	Betacam audio alignment	P2
21	9-919-573-01	Cleaning liquid	Cleaning	P1/ P2
22	A-8319-485-A	IC memoy card box, CDS-20 assembly	Software update	P2
23	A-8322-417-A	CN-1935 board	Connection of the IC memory card box	P2
24	1-772-003-11	IC memoy card (2 MB), MB98A81183	Software update	P2
	1-772-004-11	IC memoy card (4 MB), MB98A81273	Software update	P2
25	1-958-196-14	Extension harness (SR66-EQ3)	Extension of the RP-107 board	P2
26	1-959-894-11	Extension harness (DR1)	Extension of the RP-107 board	P2
27	1-959-895-11	Extension harness (DR2)	Extension of the RP-107 board	P2

*: P1= Used in the maintenance manual Part 1./P2= Used in the maintenance manual Part 2.

Refer to “1-3. Alignment tape” for details of the alignment tapes.

① 	② 	③ 	④ 
⑤ 	⑥ 	⑦ 	⑧ 
⑨ 	⑩ 	⑪ 	⑫ 
⑬ 	⑭ 	⑮ 	⑯ 
⑰ 	⑱	⑲ 	⑳ 
㉑ 	㉒ 	㉓ 	㉔ 
㉕ 	㉖ 	㉗ 	

1-3. Alignment Tape

Describes the alignment tapes using for adjusting the unit.

1. CR2-1B (SONY part No. 8-960-096-01) : For 525/60 system

Used for tracking adjustment.

Time (min. : sec.)	Video Track	AFM	LTC track	CTL track
00:00 -28:00	Y : 4 MHz C : 5 MHz	—	7: 3 pulse	CTL

∗ The displayed TC data is interpolated by CTL signal due to the duty 7:3 pulse is recorded on the time code track.

2. CR5-1B (SONY part No. 8-960-096-41) : For 525/60 system

Used for video adjustment.

Time (min. : sec.)	Video	AFM	LAU tracks	CTL track
0:00 -	RF sweep	No signal	No signal	CTL
2:00 -	60% H sweep (CTDM)	No signal	No signal	CTL
5:00 -	Pulse & Bar (CTDM)	No signal	No signal	CTL
8:00 -	60% multi-burst	No signal	No signal	CTL
11:00 -	Pulse & Bar	No signal	No signal	CTL
14:00 -	75% color-bar	400 kHz sine wave with 25 kHz deviation	No signal	CTL
16:30 -	75% color-bar	400 kHz sine wave with 75 kHz deviation	No signal	CTL
17:00 -	50% bowtie & 12.5T	No signal	No signal	CTL
19:00 -	Line 17	No signal	No signal	CTL
22:00 -	Quad phase	No signal	No signal	CTL
24:00 -	Flat filed	No signal	No signal	CTL
26:00 -	75% color-bar with Drop-out	No signal	No signal	CTL
28:00 - 30:00	Composite V sweep with VISC	No signal	No signal	CTL

3. CR5-2A (SONY part No. 8-960-097-44) : For 525/60 system

Used for video adjustment.

Time (min. : sec.)	Video	LAU tracks	CTL track
0:00 -	75% color-bar	No signal	CTL
3:00 -	60% multi-burst	No signal	CTL
6:00 -	50% bowtie & 12.5T	No signal	CTL
9:00 -	Pulse & Bar	No signal	CTL
11:00 -	Quad phase	No signal	CTL
13:00 - 15:00	Composite monoscope (Switching position is shifted.)	No signal	CTL

4. CR8-1A (SONY part No. 8-960-097-45) : For 525/60 system

Used for audio adjustment.

Time (min. : sec.)	LAU tracks	CTL track	Video
0:00 -	1 kHz sine wave, 0 VU	CTL	No signal
2:55 -	No signal	CTL	No signal
3:00 -	10 kHz sine wave, −10 VU	CTL	No signal
4:55 -	No signal	CTL	No signal
5:00 -	1 kHz sine wave, −20 VU	CTL	No signal
5:55 -	No signal	CTL	No signal
6:00 -	40 Hz sine wave, −20 VU	CTL	No signal
6:25 -	No signal	CTL	No signal
6:30 -	7 kHz sine wave, −20 VU	CTL	No signal
6:55 -	No signal	CTL	No signal
7:00 -	10 kHz sine wave, −20 VU	CTL	No signal
7:25 -	No signal	CTL	No signal
7:30 -	15 kHz sine wave, −20 VU	CTL	No signal
7:55 -	No signal	CTL	No signal
8:00 - 10:00	1 kHz sine wave, 0 VU	1 kHz sine wave, 0VU	No signal

1-4. Disconnecting/Connecting Flexible Card Wire

Three flexible card wires are used to connect between the MB-838 and SV-206 boards.

Notes

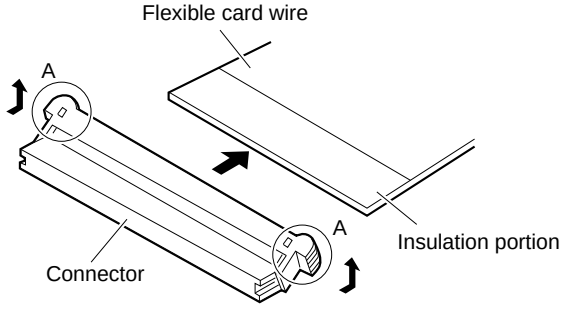
- Be sure to turn off the power when disconnecting and connecting the flexible card wire. To turn off the power, be sure to disconnect the cable connected at the DC IN connector or the battery, in addition to turning off the power switch.
- The holded flexible card wire remarkably shortens the life span. Pay careful attention when handling it.

Removal

Notes

- Do not pull the flexible card wire before unlocking.
- There are a conductive portion (printed side) and insulation portion (white belt) in the flexible card wire. Confirm the direction of the flexible card wire before connecting it.

1. Unlock by shifting portion A of the connector in the direction indicated by the arrow, then pull out the flexible card wire.

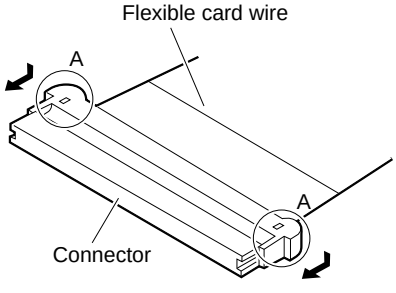


Installation

Notes

- Confirm that no stain or dust adheres on the conductive surface of the flexible card wire.
- Confirm that the connector is unlocked.

1. Insert the flexible card wire firmly as far as it will go.
2. Push portion A of the connector in the direction indicated by the arrow and lock the connector. At that time, take care that the flexible card wire is not inclined.



1-5. NV-RAM/EEPROM

Describes ICs that require the initialization and adjustment of data after parts are replaced.

Board name	Ref. No.	Address	IC type	Description
DEC-97	IC34	C3 (Side A)	EEPROM	DEC board adjustment data
DM-121	IC909	M7 (Side A)	NV-RAM	DM board adjustment data
	IC1812	C6 (Side A)	NV-RAM	
KY-446	IC108	E8 (Side B)	EEPROM	Sub-LCD menu set data
SDI-23	IC457	E1 (Side A)	EEPROM	SDI board adjustment data
SV-206	IC404	D8 (Side A)	NV-RAM	Servo data, hours meter data and serial No. data
SY-272	IC1	A1 (Side A)	NV-RAM	Main menu, error logger and calender/clock set data
TG-191	IC406	C4 (Side A)	EEPROM	TG board adjustment data

1-5-1. Initialization and Adjustment

Explains how to initialize and adjust the data when adjustment and set data items are lost during IC replacement.

1. IC34 on DEC-97 board

(1) Adjust all menu items of the maintenance mode below.
(For the adjustment, refer to Section 7.)
- A24: INPUT CF DETECT
- A25: DEC VR or A26: DEC VR(LOOP)

2. IC909 and IC1812 on DM-121 board

- IC909

(1) Set initial values to all menu items of the maintenance mode below, then adjust them.
(For the setting and adjustment, refer to Section 7.)
- A32: DM VR1
- A33: DM VR2
- A34: DM VR3
- A35: DM VR4
- A36: DM VR5
- A38: TBC VR2

- IC1812

(1) Set initial values to all A37: TBC VR 1 menu items of the maintenance mode below, then adjust them.
(For the setting and adjustment, refer to Section 7.)

3. IC108 on KY-446 board

(1) Reset the sub-LCD menu data.
(For the setting, refer to the operation manual.)

4. IC457 on SDI-23 board

(1) Adjust all A23: SDI VR menu items of the maintenance mode automatically.
(For the adjustment, refer to Section 2.)
- A231: SDI ENC VCO
- A232: SDI DEC VCO
- A2F: NV-RAM CONTROL

5. IC404 on SV-206 board

- Servo adjustment data

(1) Turn on the power while pressing S101 on the SV-206 board and initialize the servo adjustment data.

Note

Continue pressing S101 until three seconds pass after powering ON.

(2) Adjust all A0: SERVO ADJUST menu items of the maintenance mode.
(For the adjustment, refer to Section 2.)
- A001: S REEL FG DUTY
- A002: CAPSTAN FG DUTY
- A003: CAPSTAN FRICTION
- A004: CAPSTAN FREE SPEED
- A005: RF SWITCHING POSITION
- A006: NV-RAM CONTROL

- Hours meter data

(1) The hours meter data is automatically initialized to zero (“0”). The data cannot be restored.

- Serial No. data

(1) Reset the serial No. in M31 : SERIAL NUMBER of the maintenance mode.
(For the setting, refer to Section 3 in the maitenance manual. part 1.)

6. IC1 on SY-272 board

- Main menu data

(1) Reset the setup menu data.
(For the setting, refer to the operation manual.)

- Error logger data

(1) The data is lost. The data cannot be restored.

- Calender/clock data

(1) Reset the calender/clock in M2 : ERROR LOGGER of the maintenance mode.
(For the setting, refer to Section 3 in the maitenance manual. part 1.)

7. IC406 on TG-191 board

(1) Adjust all A20: VPR/TG VR menu items of the maintenance mode.
(For the adjustment, refer to Section 7.)

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1-6. PLCC IC Removal

It is recommended that the tool below is used to remove the PLCC-type IC inserted into an IC socket.

Tool required

Extraction tool for PLCC socket
Sony part No.: J-6035-070-A

Note

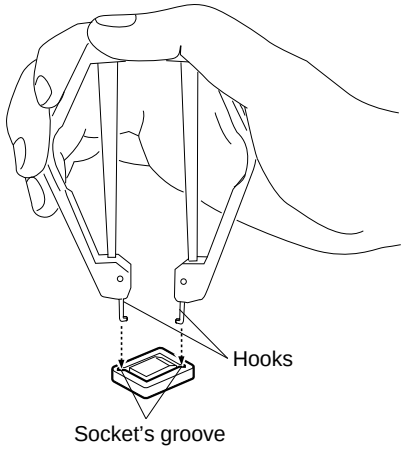
This tool can be used for IC whose number of pins is 20 to 124.

Procedure

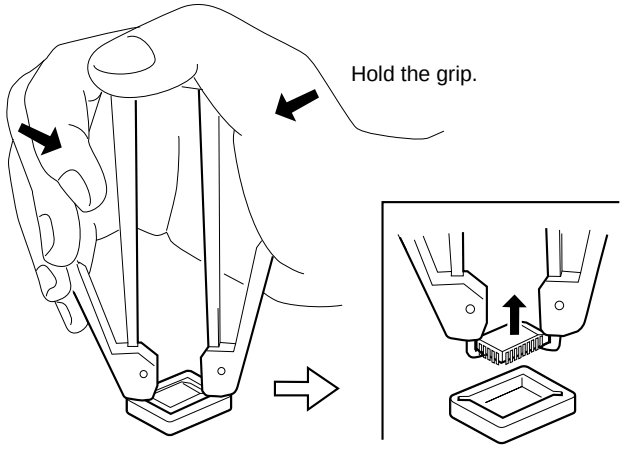
Notes

- Do not pull the IC chip upward using an extraction tool.
- Do not interpose the tool by excessive force.

1. Align the tool hook with the groove of an IC socket, then insert.



2. Hold the grip as shown in the figure and catch the PLCC IC.
3. Lift the tool with holding the grip and remove the PLCC IC.



Section 2
Maintenance Mode

2-1. Overview of Maintenance Mode

This unit has the maintenance mode that is useful during maintenance and trouble diagnosis.
This maintenance mode consists of the four modes below.
The contents of the maintenance mode are superimposed on the LCD monitor and the video monitor connected to the VIDEO OUTPUT 2 (SUPER) connector.
To superimpose the contents of the maintenance mode, set the SUPER item on the general setting page of the sub LCD menu to ON. (For the sub LCD menu. refer to the operation manual.)
This section does not explain about items which is described in the maintenance manual part 1.

```
     MAINTENANCE MODE

*M0  :  TAPE MAINTENANCE
 M2  :  ERROR LOGGER
 M3  :  OTHERS
 M4  :  SETUP MAINTENANCE
```

(Mode screen during activation of maintenance mode)

Note
The typeface of characters displayed on the video monitor differs from the actual one.

M0 : TAPE MAINTENANCE ..... (Section 2-2)
This mode is used for maintenance of a VTR part.
In this manual, explains tape maintenance items for adjustment only.

```
  TAPE MAINTENANCE MODE

*C0  :    SERVO       CHECK
 C2  :  AUDIO/VIDEO   CHECK
 A0  :    SERVO       ADJUST
 A1  :  BETACAM REC   ADJUST
 A2  :  AUDIO/VIDEO   ADJUST
 A3  :  BETACAM PB    ADJUST
 A4  :  MECHANISM     ADJUST
```

M2 : ERROR LOGGER
This mode is used to display the record of errors (error logging) that occur in this unit.

```
       ERROR LOGGER
         (001/003)
*001 REEL TROUBLE-1
 002 TAPE TENSION ERROR
 003 INTERNAL I/F ERROR
------------------------
 TAPE ERROR            ON
 WARNING               ON
 CONDITION             ON


    '97 09 03  09:23:00
```

Note
The display on the left is one of the displayed examples.

M3 : OTHERS ..... (Section 2-3)
This mode is used for checking the others.

```
        M3:OTHERS

*M30:ROM VERSION
 M31:SERIAL NUMBER
 M35:MEMORY CHECK
 M36:HOUR METER RESET
 M3F:MEMORY CARD UTILITY
```

M4 : SETUP MAINTENANCE
This mode is used for the setup menu.

```
 SETUP MAINTENANCE MODE

*M40  :  EXTENDED MENU
 M49  :  RESET ALL SETUP
```

Buttons and Switches for Operation

The main buttons and switches related to the operation of maintenance mode are as follows: The ordinary functions of these buttons and switches and how to use them are described below.

① Message display area on sub LCD
The sub LCD displays the menu (mode) No., menu title, selection item, status, or data. The menu (mode) No. or selection item block blinks while the menu (mode) or selection item is specified (not including the servo menu in the TAPE maintenance mode). For manual adjustment, the data block blinks. In the state where the tape operation (PB, REC, F FWD, and REW) can be performed, the sub LCD functions as an ordinary time counter.
There is a menu (mode) that contains insufficient information displayed in the message display area of sub LCD. Since the information displayed on the LCD monitor is easier to operate and check, usually use a LCD monitor.

② MENU button
Press this button in the maintenance mode to return to the screen (state) preceding by one step.
The maintenance mode is terminated if this button is pushed when the mode screen is displayed (mode No. M0, M2 or M4 blinks in a message display area of sub LCD).

③ SET button
Press this button in the maintenance mode to select or execute the menu (mode) selected using a ⑦ JOG/Shuttle dial.
The maintenance mode can be activated when this SET button is pressed while pressing the ④ CTL/TC/U-BIT button in the setup menu mode with ⑨ DIP switch S202-2 on the SY-272 board set to ON (upper).

④ CTL/TC/U-BIT button
The maintenance mode can be activated when the ③ SET button is pressed while pressing this button in the setup menu mode with ⑨ DIP switch S202-2 on the SY-272 board set to ON (upper).

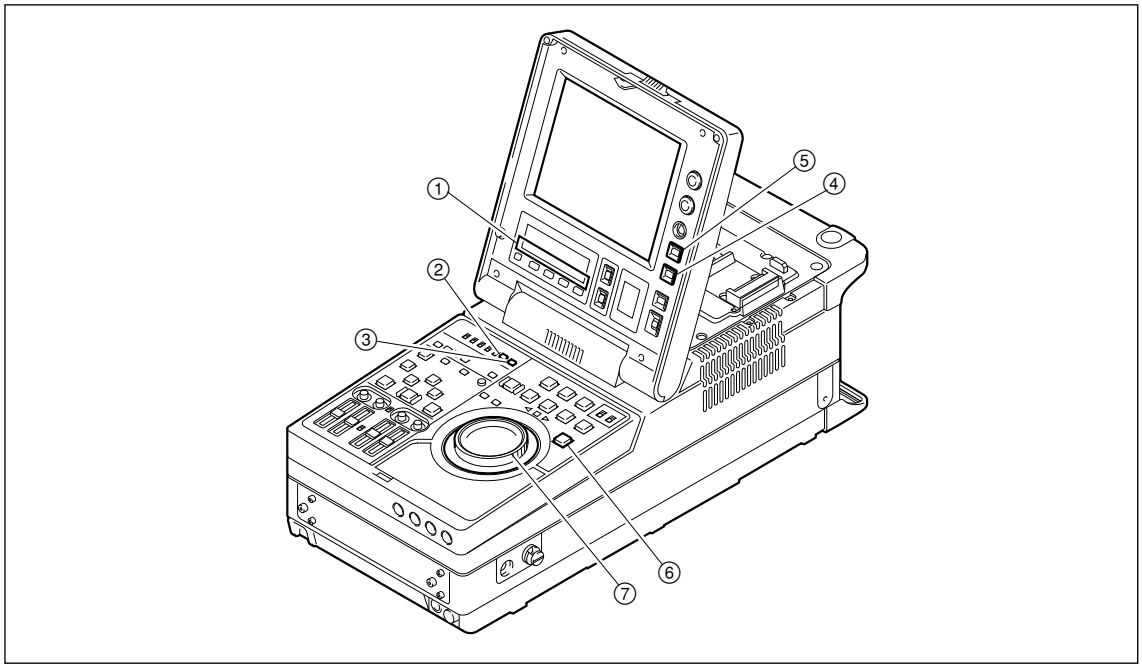
⑤ RESET button
Press this button in the error logger mode to erase the recorded error log.

⑥ Search button
The data value or setting can be changed when the ⑦ JOG/shuttle dial is turned while pressing this button.

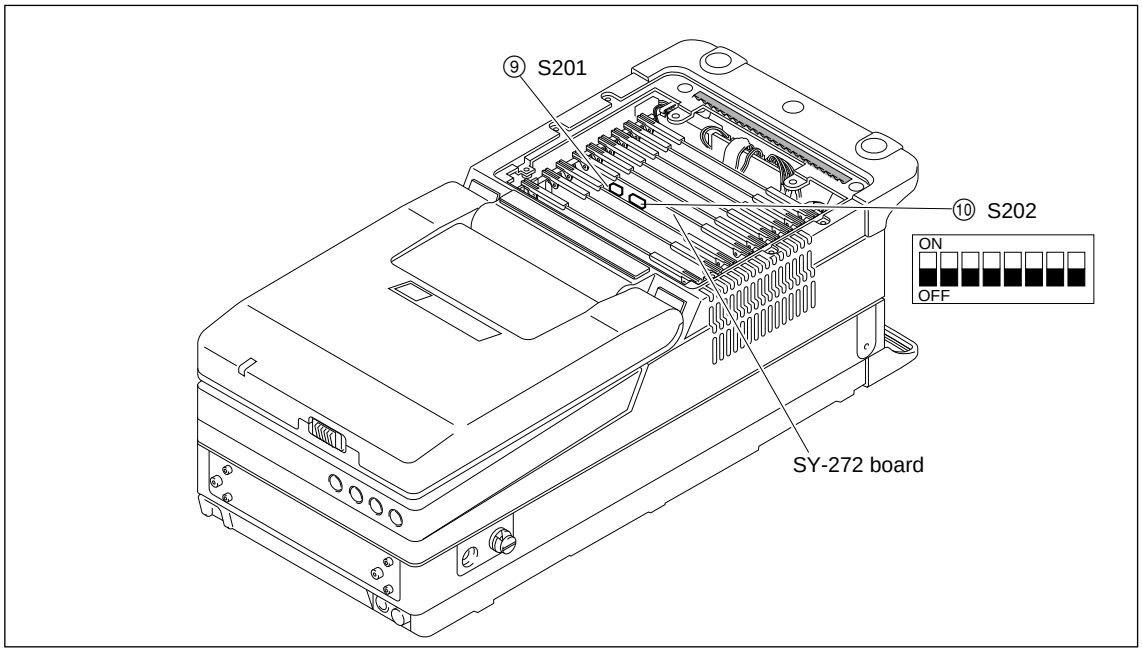
⑦ JOG/shuttle dial
Turn the JOG dial or shuttle dial (depend on search mode) to specify the menu (mode) or selection item. An "∗" mark moves on the LCD monitor. In a sub LCD, the display is replaced and the specified item blinks. ("JOG DIAL" is displayed on the LCD monitor.)
The data value or setting can be changed when the JOG dial or shuttle dial (depend on search mode) is turned while pressing the ⑥ search button.

ⓐ S201/SY-272 board: Maintenance mode start switch (MAINTE MODE START)
Press this switch to activate the maintenance mode.

ⓑ S202-2/SY-272 board: Maintenance mode access permission switch (MAINTE MODE Access)
Set this switch to ON in advance when activating the maintenance mode by the button operation on the control panel.



Lower Control Panel



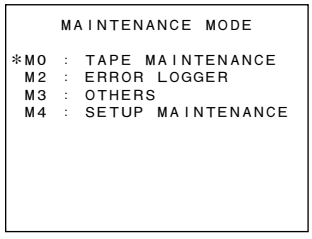
Location of Switches on SY-272 Board

Note

Remove the battery sub panel referring to Section 1-6-1 in the maintenance manual part 1 when operating the switches on the SY-272 board. Change the setting of DIP switch S202 with the power switch set to OFF.

Activating the Maintenance Mode

(1) Press the ⑧ S201 switch (on the SY-272 board).
(2) The mode screen in the maintenance mode is superimposed on the LCD monitor.
In a ① sub LCD, “M0-TAPE MAINTEN” is displayed.



LCD Monitor

Sub LCD

Activating the Maintenance Mode from Control Panel

The maintenance mode can be activated by the operation below when ⑨S202-2 switch (on the SY-272 board) is set to ON (upper).

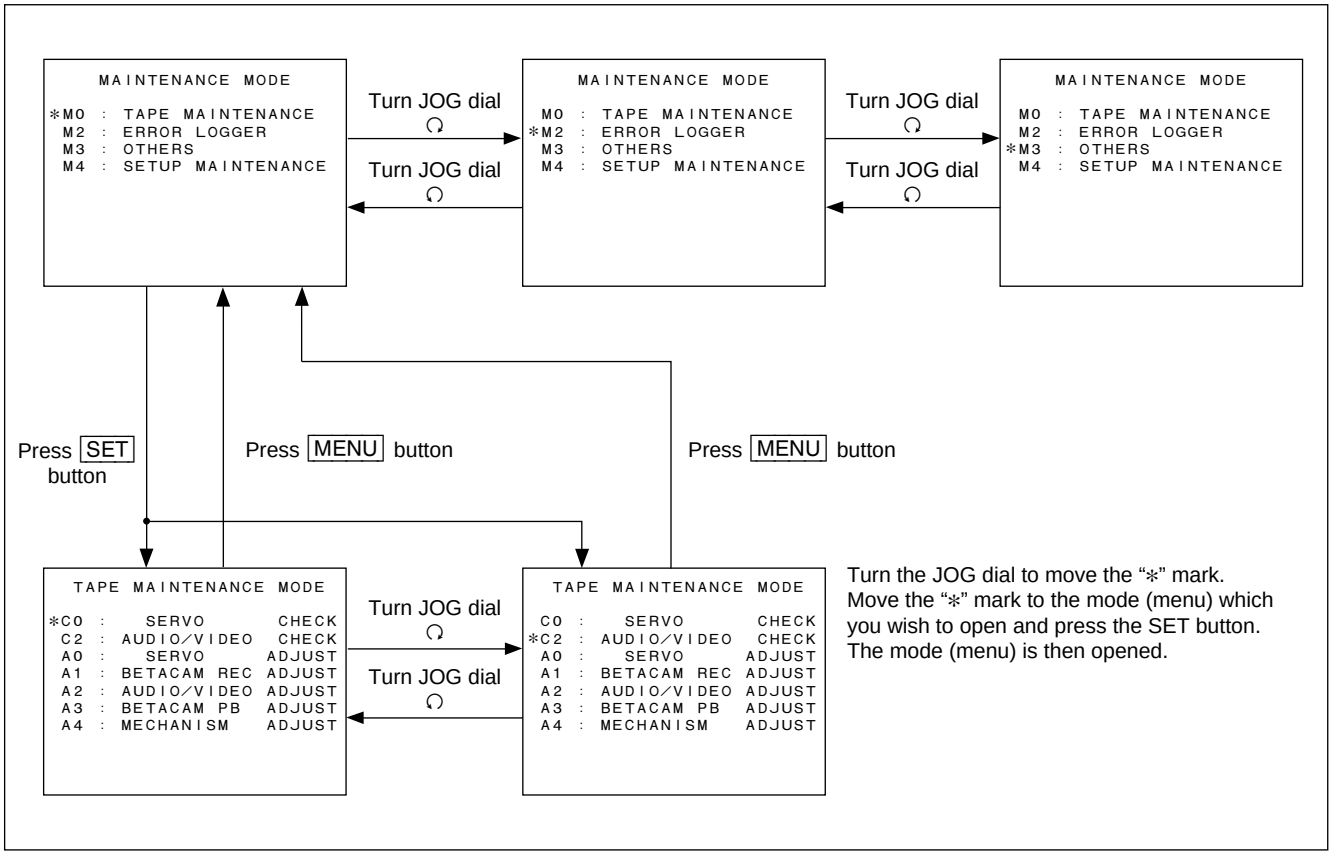
(1) Press the ② MENU button once.
(Execute the setup menu mode from the operation mode.)
(2) Press the ③ SET button while pressing the ④ CTL/TC/U-BIT button.
(Execute the maintenance mode from the setup menu mode.)
(3) The mode screen in the maintenance mode is displayed on the LCD monitor.

Terminating the Maintenance Mode

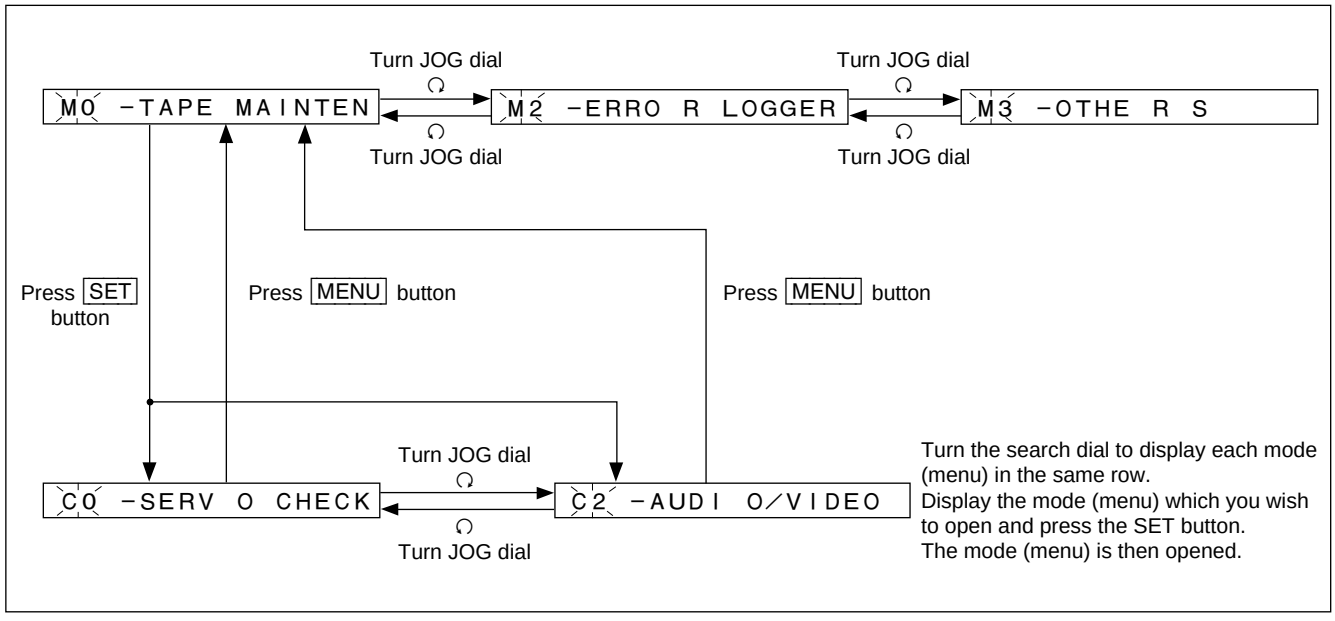
(1) Press the ② MENU button several times to display the mode screen on the LCD monitor.
The selected mode No. and title are displayed in a sub LCD.
(2) Press the ② MENU button again to terminate the maintenance mode.

Specifying the Menu (Mode) and Item

How to specify the menu (mode) and item using the JOG dial (JOG mode) is described below with the mode selection given as an example.


MAINTENANCE MODE
*M0 : TAPE MAINTENANCE
M2 : ERROR LOGGER
M3 : OTHERS
M4 : SETUP MAINTENANCE
MAINTENANCE MODE
M0 : TAPE MAINTENANCE
*M2 : ERROR LOGGER
M3 : OTHERS
M4 : SETUP MAINTENANCE
MAINTENANCE MODE
M0 : TAPE MAINTENANCE
M2 : ERROR LOGGER
*M3 : OTHERS
M4 : SETUP MAINTENANCE
Turn JOG dial
Turn JOG dial
Turn JOG dial
Turn JOG dial
Press SET button
Press MENU button
Press MENU button
TAPE MAINTENANCE MODE
*C0 : SERVO CHECK
C2 : AUDIO/VIDEO CHECK
A0 : SERVO ADJUST
A1 : BETACAM REC ADJUST
A2 : AUDIO/VIDEO ADJUST
A3 : BETACAM PB ADJUST
A4 : MECHANISM ADJUST
TAPE MAINTENANCE MODE
C0 : SERVO CHECK
*C2 : AUDIO/VIDEO CHECK
A0 : SERVO ADJUST
A1 : BETACAM REC ADJUST
A2 : AUDIO/VIDEO ADJUST
A3 : BETACAM PB ADJUST
A4 : MECHANISM ADJUST
Turn JOG dial
Turn JOG dial
Turn the JOG dial to move the "*" mark.
Move the "*" mark to the mode (menu) which you wish to open and press the SET button.
The mode (menu) is then opened.

Example in Superimpose Picture

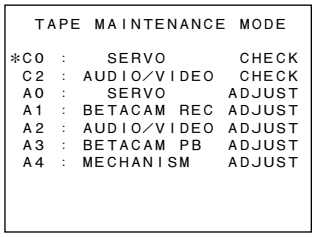

M0 -TAPE MAINTEN
M2 -ERRO R LOGGER
M3 -OTHE R S
Turn JOG dial
Turn JOG dial
Turn JOG dial
Turn JOG dial
Press SET button
Press MENU button
Press MENU button
C0 -SERV O CHECK
C2 -AUDI O/VIDEO
Turn JOG dial
Turn JOG dial
Turn the search dial to display each mode (menu) in the same row.
Display the mode (menu) which you wish to open and press the SET button.
The mode (menu) is then opened.

Example in sub LCD

2-2. TAPE Maintenance Mode (M0)

2-2-1. Overviews

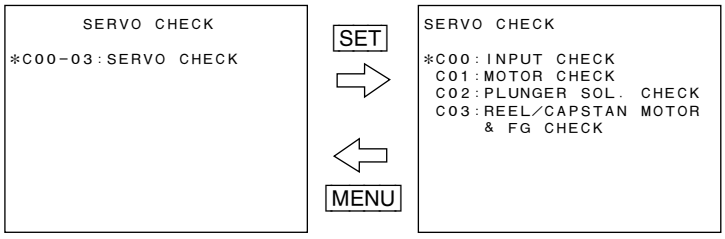
The TAPE maintenance mode is used for the check and maintenance.
This unit has the seven submodes below.


TAPE MAINTENANCE MODE
*C0 : SERVO CHECK
C2 : AUDIO/VIDEO CHECK
A0 : SERVO ADJUST
A1 : BETACAM REC ADJUST
A2 : AUDIO/VIDEO ADJUST
A3 : BETACAM PB ADJUST
A4 : MECHANISM ADJUST

TAPE Maintenance Mode

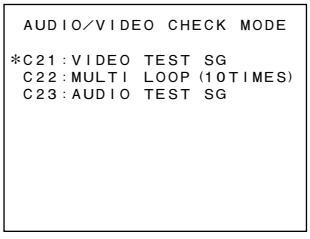
C0: SERVO CHECK

This submode is used to check the servo system.
For more details, refer to maintenance manual part 1.



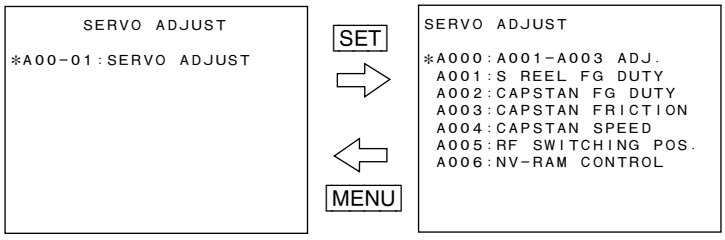
C2 : AUDIO/VIDEO CHECK

This submode is used to check the audio and video systems.
For more details, refer to the maintenance manual part 1.



A0 : SERVO ADJUST

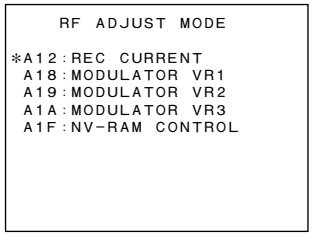
This submode is used to adjust the servo system.
For more details, refer to Section 2-2-2.



Title	Page	Description
A000 : A001-A003 ADJ.	2-12	Continuously executes the automatic adjustment menus (A001 to A003).
A001 : S REEL FG DUTY	2-13	Automatically adjusts the duty ratio of an S reel FG.
A002 : CAPSTAN FG DUTY	2-13	Automatically adjusts the duty ratio of a capstan FG.
A003 : CAPSTAN FRICTION	2-13	Automatically adjusts the capstan friction.
A004 : CAPSTAN FREE SPEED	2-14	Automatically adjusts the capstan free speed.
A005 : RF SWITCHING POS.	2-15	Automatically adjusts the RF switching position.
A006 : NV-RAM CONTROL	2-17	Saves the adjustment data in a servo system.

A1 : BETACAM REC ADJUST

This submode is used to adjust the recording system.
For more details, refer to Section 2-2-3.



Title	Page	Description
A12 : REC CURRENT	2-18	Automatically adjusts the recording current.
A18 : MODULATOR VR 1	2-18	Adjusts the modulator circuit (metal mode).
A19 : MODULATOR VR 2	2-19	Adjusts the modulator circuit (oxide mode).
A1A : MODULATOR VR 3	2-19	Adjusts the modulator circuit (input level).
A1F : NV-RAM CONTROL	2-20	Saves the adjustment data in a recording system.

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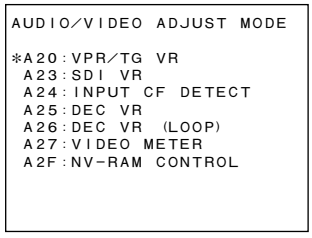
A2 : AUDIO/VIDEO ADJUST

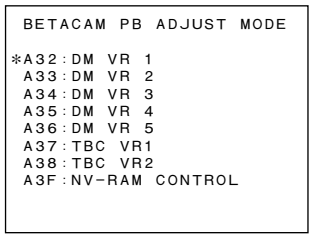
This submode is used to adjust the audio and video systems.
For more details, refer to Section 2-2-4.



Title	Page	Description
A20 : VPR/TG VR	2-22	Adjusts the reference signal system and analog video output system on the VPR-59 and TG-191 boards.
A23 : SDI VR	2-22	Adjusts the SDI input/output interface.
A231 : SDI ENC VCO	2-22	Automatically adjusts the SDI output interface.
A232 : SDI DEC VCO	2-22	Automatically adjusts the SDI input interface.
A24 : INPUT CF DETECT	2-25	Automatically adjusts the color frame detection timing of a composite video input.
A25 : DEC VR	2-27	Adjusts the composite video input system.
A26 : DEC VR (LOOP)	2-27	Adjusts the composite video input (in the multi-loop state).
A27 : VIDEO METER	2-27	Calibration of video meter on the sub LCD.
A2F : NV-RAM CONTROL	2-29	Saves the adjustment data in audio and video systems.

A3 : BETACAM PB ADJUST

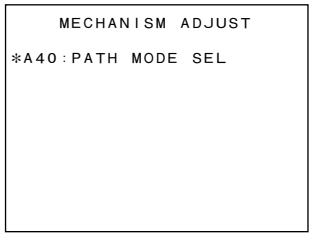
This submode is used to adjust the PB system based on a Betacam/Betacam SP format.
For more details, refer to Section 2-2-5.



Title	Page	Description
A32 : DM VR 1	2-31	Adjusts the frequency characteristics of a primary cosine equalizer (DM-121 board).
A33 : DM VR 2	2-31	Adjusts the frequency characteristics of a secondary cosine equalizer (main) (DM-121 board).
A34 : DM VR 3	2-31	Adjusts the frequency characteristics of a secondary cosine equalizer (sub) (DM-121 board).
A35 : DM VR 4	2-31	Adjusts the guard band width and sets the DC offset level of an over-modulation compensation circuit.
A36 : DM VR 5	2-32	Adjusts the threshold level of a dropout and sets the threshold level of an RF envelope.
A37 : TBC VR 1	2-32	Sets the read clock timing on the DM-121 board and the data of a PB VISC phase detection circuit.
A38 : TBC VR 2	2-32	Sets the Y/C delay.
A3F : NV-RAM CONTROL	2-33	Saves the adjustment data in an analog video PB system.

A4 : MECHANISM ADJUST

This submode is used to adjust the mechanism part.
For more details, refer to Section 2-2-6.



Title	Page	Description
A40 : PATH MODE SEL	2-34	Sets the tape PB mode (Used for tape transport adjustment).

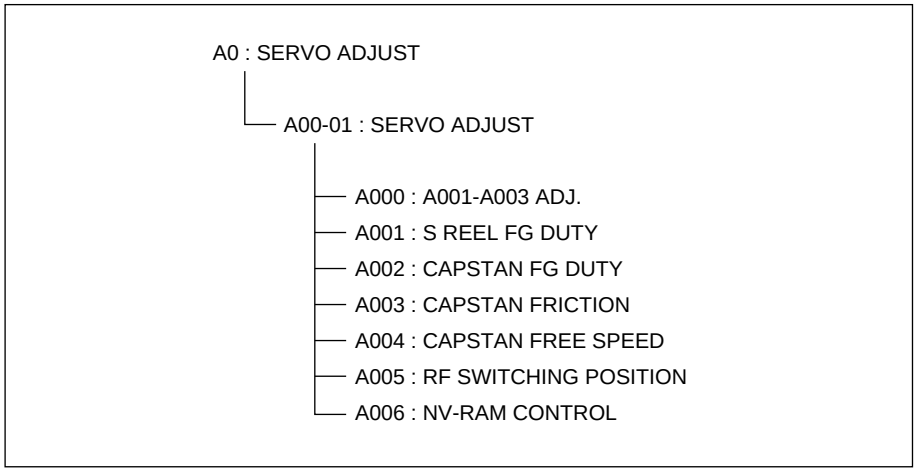
2-2-2. SERVO ADJUST Mode (A0)

The A0 : SERVO ADJUST mode is used to adjust the servo system.

Note

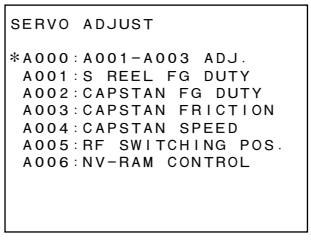
In the SERVO ADJUST mode, only the menu number is displayed in a sub LCD. (A00-01 is displayed as A00.)

Note


A0 : SERVO ADJUST
A00-01 : SERVO ADJUST
A000 : A001-A003 ADJ.
A001 : S REEL FG DUTY
A002 : CAPSTAN FG DUTY
A003 : CAPSTAN FRICTION
A004 : CAPSTAN FREE SPEED
A005 : RF SWITCHING POSITION
A006 : NV-RAM CONTROL

The cassette tape is automatically ejected when the A00-01 : SERVO ADJUST menu is shifted to the lower-level menu with the cassette tape inserted into this unit.

A00-01 : SERVO ADJUST



A000 : A001-A003 ADJ.

This menu is used to execute the adjustment menus below automatically and continuously.

A001 : S REEL FG DUTY
A002 :CAPSTAN FG DUTY
A003 :CAPSTAN FRICTION

To execute the adjustment menus

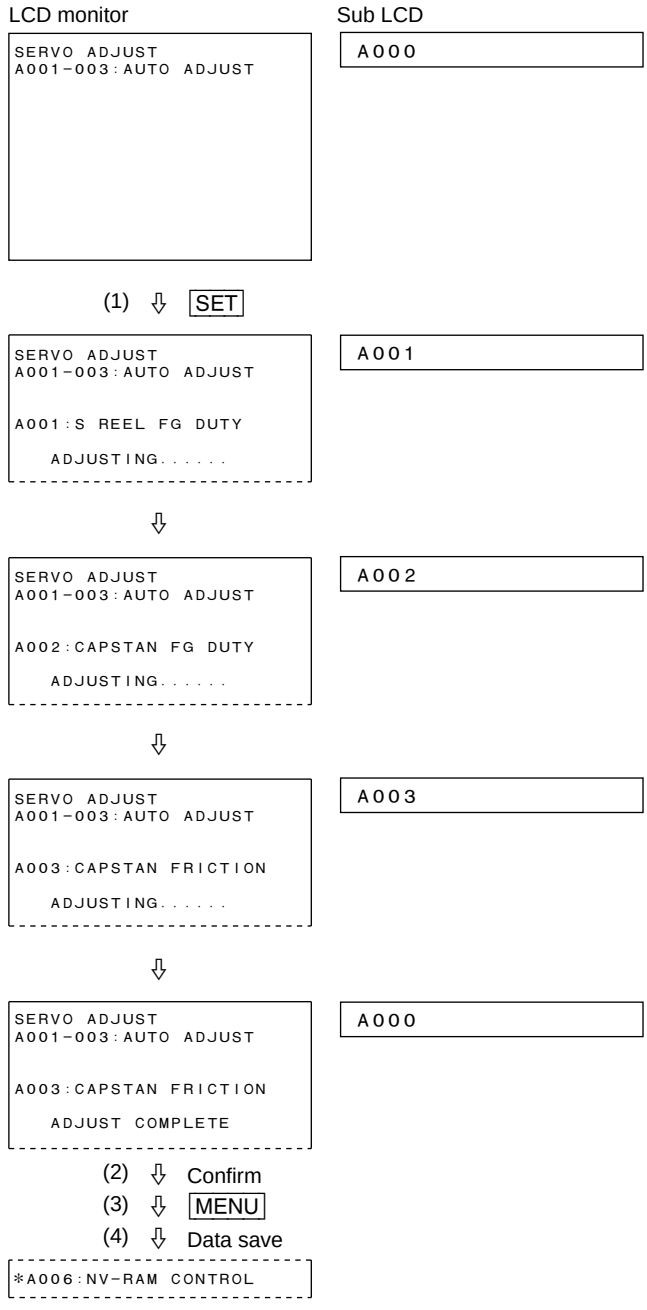
(1) Press the SET button.
- The automatic adjustment is initiated when the SET button is pushed.
  The execution time is about 30 seconds.
- The adjustment menu name in execution and message “ADJUSTING.....” are displayed on the LCD monitor during automatic adjustment. Only the menu number is displayed in a sub LCD.
- Message “ADJUST COMPLETE” is momentarily displayed on the LCD monitor when each adjustment menu is completed normally.
  Message “# ADJUST INCOMPLETE #” is displayed on the LCD monitor when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 2-16 when this message is displayed.

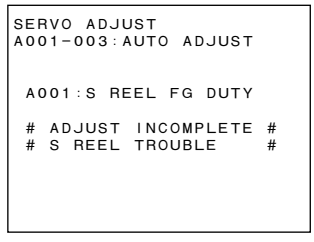
(2) Confirm the adjustment result.
- Message “ADJUST COMPLETE” remains displayed on the LCD monitor when all adjustments are completed normally.

(3) Press the MENU button to terminate the menu.

(4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A006 : NV-RAM CONTROL menu.

Example of display and operation





Ex.: When failing the automatic adjustment

A001 : S REEL FG DUTY
A002 : CAPSTAN FG DUTY
A003 : CAPSTAN FRICTION

These menus are used to perform the automatic adjustments below.

A001 : S reel FG duty adjustment
A002 : Capstan FG duty adjustment
A003 : Capstan friction adjustment

To execute the automatic adjustments

(1) Press the SET button.
- The automatic adjustment is initiated when the SET button is pushed.
  The execution time is about 15 seconds for A001 to A003.
- Message “ADJUSTING.....” is displayed on only the LCD monitor during automatic adjustment.

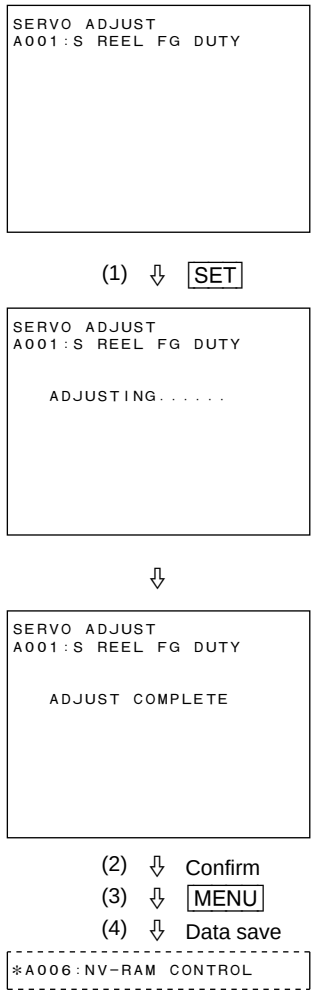
(2) Confirm the adjustment result.
- Message “ADJUST COMPLETE” is displayed on the LCD monitor when the automatic adjustment is completed normally.
- Message “# ADJUST INCOMPLETE #” is displayed on the LCD monitor when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 2-16 when this message is displayed.

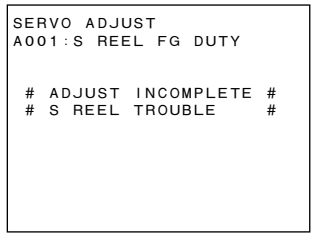
(3) Press the MENU button to terminate the menu.

(4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A006 : NV-RAM CONTROL menu.

Example of display and operation

Example of A001 : S REEL FG DUTY





Ex.: When failing the automatic adjustment

A004 : CAPSTAN FREE SPEED

This menu is used to perform the automatic adjustment of a capstan free speed.

Note

Adjust in 525/60 system.

To execute the automatic adjustment

Note

Message “SET ALIGNMENT TAPE AND PUSH PLAY KEY” is displayed on the LCD monitor when this menu is opened. However, it is not necessary to press the PLAY button.

(1) Insert an alignment tape CR2-1B.
- The adjustment is initiated when an alignment tape is inserted.
- Message “ADJUSTING.....” is displayed on only the LCD monitor during automatic adjustment.

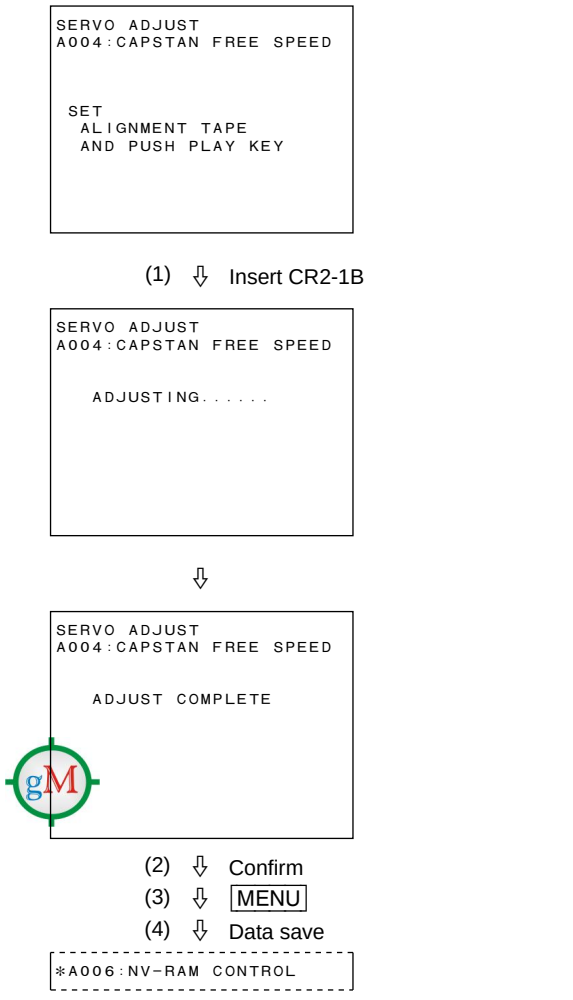
Notes
- Be sure to use the specified alignment tape.
  If the specified cassette tape is not used, the adjustment cannot be properly performed even if message “ADJUST COMPLETE” is displayed after it is completed.
- The tape amount on the portion that can be played back after an alignment tape is inserted must exceed the adjustment execution time.
  The adjustment execution time is usually about 15 seconds.

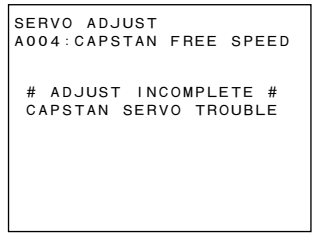
(2) Confirm the adjustment result.
- Message “ADJUST COMPLETE” is displayed on the LCD monitor when the automatic adjustment is completed normally.
  An alignment tape is ejected automatically.
- Message “# ADJUST INCOMPLETE #” is displayed on the LCD monitor when no adjustment can be performed. The automatic adjustment is then interrupted. Refer to the “For Automatic Adjustment Failure” on page 2-16 when this message is displayed.

(3) Press the MENU button to terminate the menu.

(4) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A006 : NV-RAM CONTROL menu.

Example of display and operation





Ex.: When failing the automatic adjustment

A005 : RF SWITCHING POS.

This menu is used to adjust the RF switching position automatically.

To execute the automatic adjustment

(1) Confirm that a ∗ mark is assigned to the "AUTO" display on the LCD monitor and press the SET button.
- In a sub LCD, "A0050" is displayed.

(2) Insert alignment tape CR2-1B.
- The adjustment is initiated when an alignment tape is inserted. The execution time is about 15 seconds.
- Message "ADJUSTING....." is displayed on only the LCD monitor during adjustment.

Note

If the specified cassette tape is not used, the adjustment cannot be properly performed even if message "ADJUST COMPLETE" is displayed after it is completed.

(3) Confirm the adjustment result.
- Message "ADJUST COMPLETE" is displayed on the LCD monitor when the adjustment is completed normally.
  An alignment tape is ejected automatically.
- Message "# ADJUST INCOMPLETE #" is displayed on the LCD monitor when no adjustment can be performed. The adjustment is then interrupted. Refer to the "For Automatic Adjustment Failure" on page 2-16 when this message is displayed.

(4) Press the MENU button to terminate the menu.

(5) To save the adjustment data in the NV-RAM of a servo system, execute the SAVE SERVO ADJUST data in an A006 : NV-RAM CONTROL menu.

Example of display and operation

LCD monitor

```
SERVO ADJUST
A005:RF SWITCHING POS.

*AUTO


    PG DATA:BDF5
```

Sub LCD: A0050

(1) ⇩ SET

```
SERVO ADJUST
A005:RF SWITCHING POS.

 SET
 CR2-1B
 ALIGNMENT TAPE
 TC 00:25:00:00

    PG DATA:C000
```

Sub LCD: A005

(2) ⇩ Insert CR2-1B

```
SERVO ADJUST
A005:RF SWITCHING POS.

   ADJUSTING.....


    PG DATA:BFFF
```

Sub LCD: A005

⇩

```
SERVO ADJUST
A005:RF SWITCHING POS.

   ADJUST COMPLETE


    PG DATA:BDF7
```

Sub LCD: A005

(3) ⇩ Confirm
(4) ⇩ MENU
(5) ⇩ Data save

```
∗A006:NV-RAM CONTROL
```

```
SERVO ADJUST
A005:RF SWITCHING POS.

 # ADJUST INCOMPLETE #


    PG DATA:C000
```

When failing the automatic adjustment

For Automatic Adjustment Failure

The circuit in which failure occurred can be traced to some degree by the trouble message displayed together when message "# ADJUST INCOMPLETE #" is displayed during execution of adjustment menus A000 to A005.

Note

The trouble message display indicates that no adjustment could be performed because the circuit described in this manual does not operate normally. Moreover, other circuits (e.g., control signal system) in which failure actually occurred may also exist.

A000 : A000-A003 ADJUST

Refer to the description of A001 to A003.

A001 : S REEL FG DUTY

When "S REEL FG AMP TROUBLE" is displayed

⇨ Check the S reel FG amplifier circuit on the SV-206 board.

When "S REEL DRIVER TROUBLE" is displayed

⇨ Check the S reel motor driver circuit on the SV-206 board.

A002 : CAPSTAN FG DUTY

When "CAPSTAN FG AMP TROUBLE" is displayed

⇨ Check the capstan FG amplifier circuit on the SV-206 board.

⇨ Check the capstan motor driver circuit on the SV-206 board.

A003 : CAPSTAN FRICTION

When "T REEL TROUBLE" is displayed

⇨ Check the function cam drive circuit on the SV-206 board.

⇨ Check the function cam sensor circuit on the SV-206 board.

When "SERVO TROUBLE" is displayed

⇨ Check the capstan motor drive circuit on the SV-206 board.

⇨ Check the capstan FG shaping circuit on the SV-206 board.

A004 : CAPSTAN FREE SPEED

Confirm whether the played back tape is following alignment tape.

CR2-1B (for a 525/60 system)
CR2-1B PS (for a 625/50 system)

When "CAPSTAN SERVO TROUBLE" is displayed

⇨ Execute the capstan FG duty adjustment (A002 : CAPSTAN FG DUTY) again.

⇨ Check the capstan FG amplifier circuit and CTL amplifier circuit on the SV-206 board.

When "CAPSTAN DRIVER TROUBLE" is displayed

⇨ Check the capstan motor driver circuit on the SV-206 board.

A005 : RF SWITCHING POS.

Confirm that the played back tape is alignment tape CR2-1B.

A006 : NV-RAM CONTROL

The A006 : NV-RAM CONTROL menu is used to save the servo adjustment data adjusted in the SERVO ADJUST mode in the NV-RAM of a servo system.

CAUTION

Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when "# ADJUST INCOMPLETE #" is displayed).

Note

When adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the data save

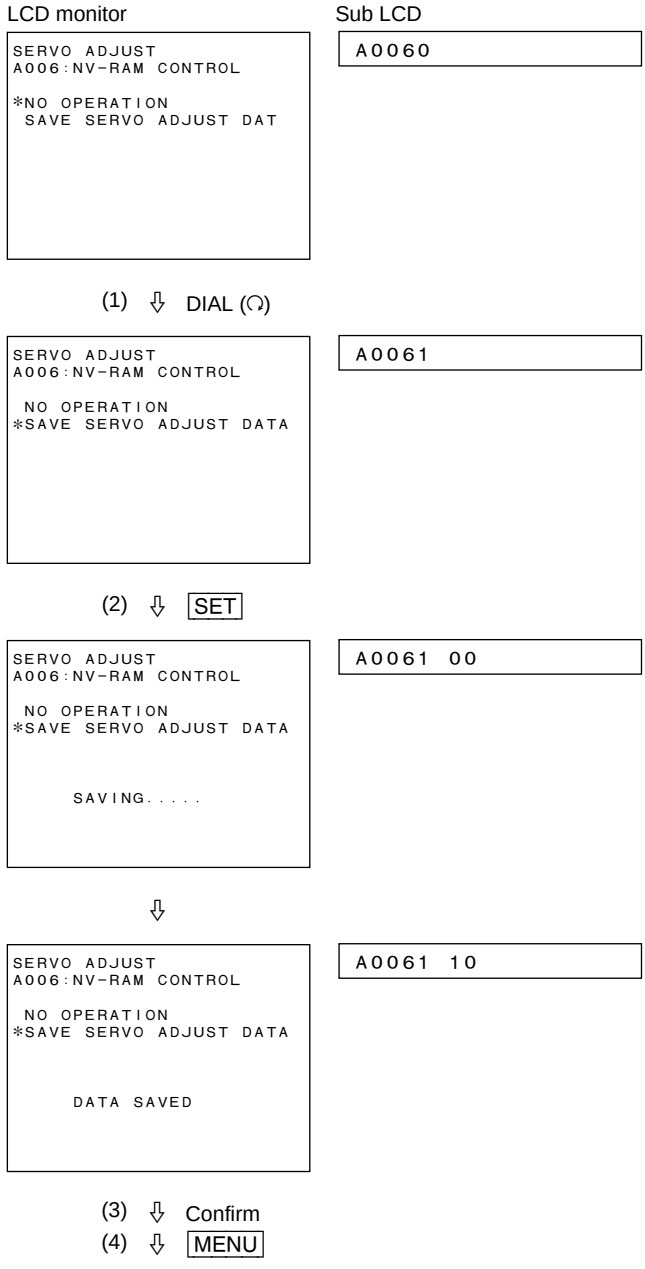
(1) Turn the JOG dial and move the ∗ mark to "SAVE SERVO ADJUST DATA" on the LCD monitor.
- In a sub LCD, NO OPERATION is displayed as "A0060", and SAVE SERVO ADJUST DATA is displayed as "A0061".

(2) Press the SET button.
- The data transmission is initiated when the SET button is pressed. The data transmission time is about ten seconds.
- Message "SAVING....." is displayed on the LCD monitor, and "A0061 00" is displayed in the sub LCD.

(3) Confirm that the data transmission is completed.
- After the data transmission is completed, message "DATA SAVED" is displayed on the LCD monitor and "A0061 10" is displayed in the sub LCD.

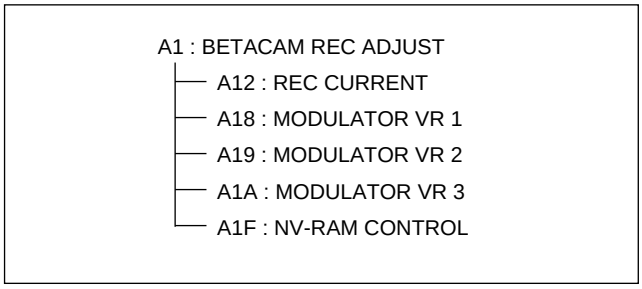
(4) Press the MENU button to terminate the menu.

Example of display and operation



2-2-3. BETACAM REC ADJUST Mode (A1)

A1 : BETACAM REC ADJUST mode is used to adjust the recording system.
This unit has the five menus.



Note

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in Section7.
If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in an A1F: NV-RAM CONTROL menu or turn off the power of this unit without selecting an A1F: NV-RAM CONTROL menu.
Never execute SAVE ALL ADJUST DATA.

To change the adjustment data manually

(1) Turn the JOG dial on the LCD monitor and move the ∗ mark to the adjustment item.
Turn the JOG dial in the sub LCD and display the item to be adjusted.
(2) Turn the JOG dial while pressing the search button.
The adjustment data then increases or decreases.

To return the adjustment data to the former state

Execute ALL DATA PREVIOUS in A1F : NV-RAM CONTROL menu.

Note

The current adjustment data can not return to the former state after executing SAVE ALL ADJUST DATA.

To save the adjustment data

Execute SAVE ALL ADJUST DATA in A1F:NV-RAM CONTROL.

A12 : REC CURRENT

This menu is used to adjust the recording electric current of the REC head.
There are adjustment items for metal and oxide tapes. Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A and C-B).

Example of display

```
BETACAM REC ADJUST MODE
A12:REC CURRENT

*METAL-Y-A            40
 METAL-Y-B            40
 METAL-C-A            40
 METAL-C-B            40
 OXIDE-Y-A            40
 OXIDE-Y-B            40
 OXIDE-C-A            40
 OXIDE-C-B            40
```

A18 : MODULATOR VR 1

This menu is used to adjust the modulator circuit of the metal mode (MD-122 board).

Example of display

```
BETACAM REC ADJUST MODE
A18:MODULATOR VR1

*METAL-Y WHITE CLIP  80
 METAL-Y DARK CLIP   80
 METAL-Y LEVEL FINE  80
 METAL-Y SRL         10
 METAL-Y HF SLICE    C0
 METAL-C HIGH CLIP   80
 METAL-C LOW CLIP    30
 METAL-C HF SLICE    C0
```

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A19 : MODULATOR VR 2

This menu is used to adjust the modulator circuit of the oxide mode (MD-122 board).

Example of display

```
BETACAM REC ADJUST MODE
A19:MODULATOR VR2

*OXIDE-Y WHITE CLIP   80
 OXIDE-Y DARK CLIP    80
 OXIDE-Y LEVEL FINE   30
 OXIDE-Y SRL          30
 OXIDE-Y HF SLICE     C0
 OXIDE-C HIGH CLIP    80
 OXIDE-C LOW CLIP     80
 OXIDE-C HF SLICE     C0
```

A1A : MODULATOR VR 3

This menu is used to adjust the modulator circuit of the video level (MD-122 board).

Example of display

```
BETACAM REC ADJUST MODE
A1A:MODULATOR VR3

*DEC Y LEVEL          80
 DEC C LEVEL          80
```

A1F : NV-RAM CONTROL

The A1F : NV-RAM CONTROL menu is used to save the recording system adjustment data adjusted in the BETACAM REC ADJUST mode in NV-RAM.
The current adjustment data can return to the former state when “ALL DATA PREVIOUS” is selected before the adjustment data is saved in NV-RAM.

Notes

- Do not save the adjustment data in NV-RAM when abnormality is found during automatic adjustment (when message “Auto Adjust Failure” or “Condition NG” is displayed).
- When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the menu

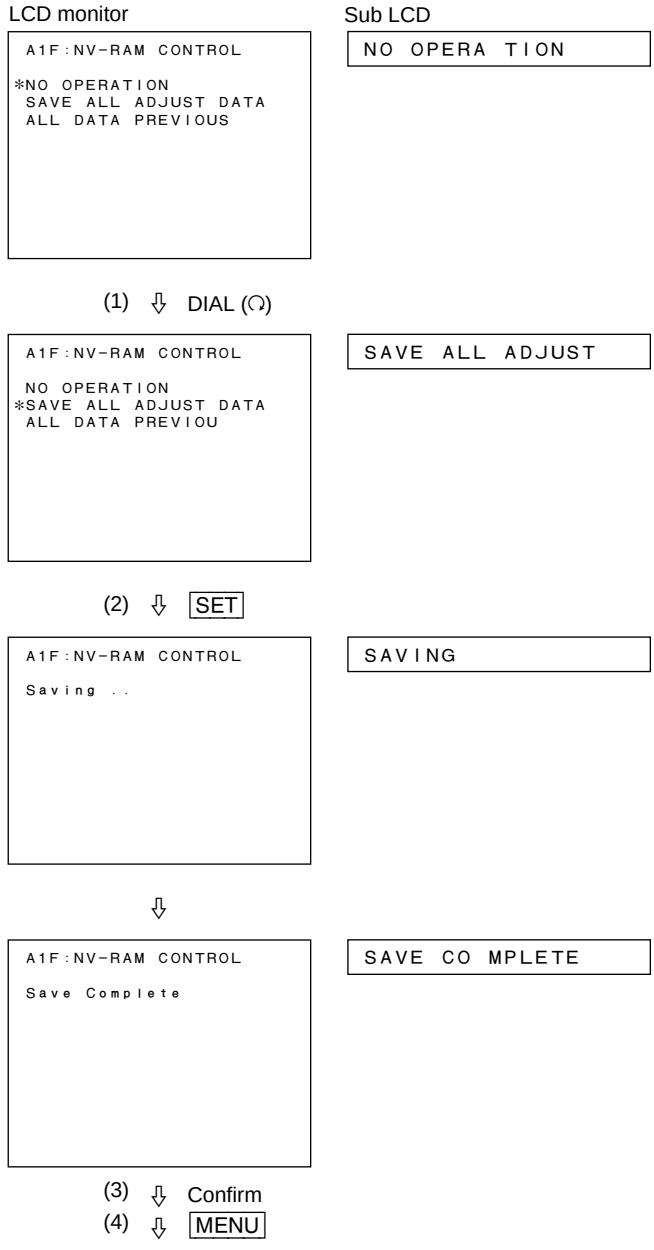
(1) Turn the JOG dial and move the ∗ mark on the LCD monitor as described below.
To save the adjustment data after adjustment:
⇨ “SAVE ALL ADJUST DATA”
To return to the adjustment data before adjustment
⇨ “ALL DATA PREVIOUS”
- In a sub LCD, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.

(2) Press the SET button.
- The data transmission is initiated when the SET button is pressed.
- Message “Saving ...” or “Loading ...” is displayed on the LCD monitor, and message “SAVING” or “LOADING” is displayed in the sub LCD.

(3) Confirm that the data transmission is completed.
- After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the LCD monitor, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the sub LCD.

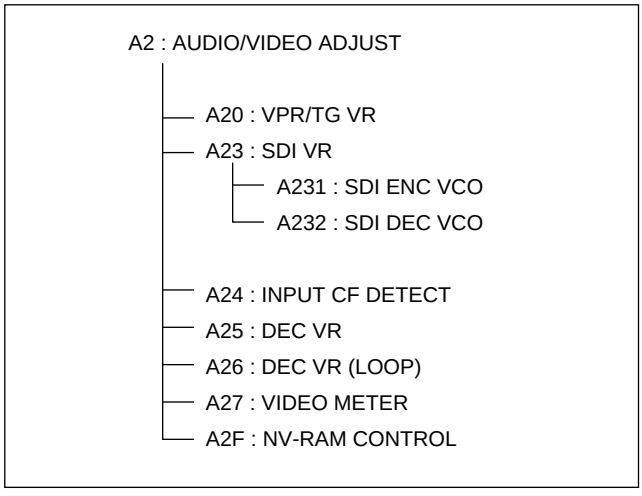
(4) Press the MENU button to terminate the menu.

Example of display and operation
(In data save)



2-2-4. AUDIO/VIDEO ADJUST Mode (A2)

The A2 : AUDIO/VIDEO ADJUST mode is used to adjust the audio and video systems.
This unit has seven menus.
In A23 : SDI VR menu, two submenus.


A2 : AUDIO/VIDEO ADJUST
A20 : VPR/TG VR
A23 : SDI VR
A231 : SDI ENC VCO
A232 : SDI DEC VCO
A24 : INPUT CF DETECT
A25 : DEC VR
A26 : DEC VR (LOOP)
A27 : VIDEO METER
A2F : NV-RAM CONTROL

Menu Tree of Audio/Video Systems Adjustment Mode

CAUTION

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in Section 7.
If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu or turn off the power of this unit without selecting an A2F : NV-RAM CONTROL menu.
Never execute SAVE ALL ADJUST DATA.

The adjustment menus other than submenus of A23 and menu A24 are used for manual adjustment.
In the submenus of A23 and menu A24, automatic adjustment (AUTO) or manual adjustment (MANUAL) can be selected.
For the automatic adjustment, refer to the operation example described in each menu.

To change the adjustment data manually

(1) Turn the JOG dial on the LCD monitor and move the ✻ mark to the item to be adjusted.
Turn the JOG dial in the sub LCD and display the item to be adjusted.
(2) Turn the JOG dial while pressing the search button.
The adjustment data then increases or decreases.

To execute the automatic adjustment

(1) Turn the JOG dial on the LCD monitor and move the ✻ mark to “MANUAL”.
Turn the JOG dial in the sub LCD and display “MANUAL”.
(2) Turn the JOG dial in FORWARD (↻) direction while pressing the search button. Message “Auto (Push SET Button)” is then displayed on the LCD monitor, and message “PUSH SET” is displayed in the sub LCD.
(3) The automatic adjustment is executed when the SET button is pressed.
- Only the display on the LCD monitor changes as described below. The displayed data value also changes.

Auto adjusting .. :	Automatic adjustment is in progress.
Auto Adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

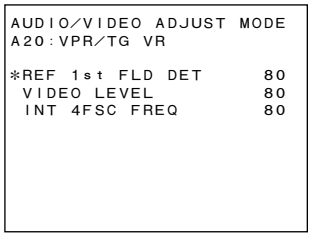
To return the adjustment data to the former state

Execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

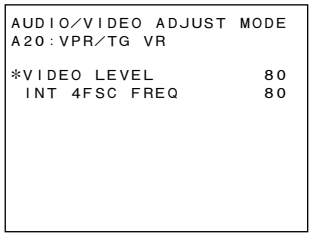
Note

The current adjustment data can not return to the former state after executing SAVE ALL DATA ADJUST DATA.

A20 : VPR/TG VR



(525/60 System)



(625/50 System)

This menu is used to adjust the reference signal and analog video output systems on the VPR-59 and TG-191 boards. In 525/60 and 625/50 systems, the displayed adjustment items differ.

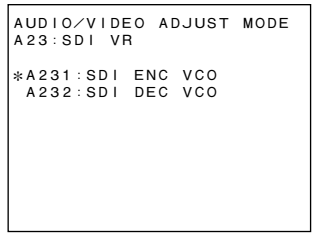
The adjustment item below can be adjusted in only a 525/60 system.

Adjustment item	Description
REF 1ST FLD DET	First-field detection timing of reference signal

The adjustment item below must be adjusted in both 525/60 and 625/50 systems.

Adjustment item	Description
VIDEO 1/2 LEVEL	Composite video output (1/2) level
INT 4FSC FREQ	Free-running frequency of internal reference signal 4fsc

A23 : SDI VR



This menu is used to adjust the VCO free-running frequency of SDI input/output interfaces.

Note

Before adjustment, turn the power on and warm up the unit more than ten minutes.

A231 : SDI ENC VCO

This submenu is used for an SDI output interface (SDI encoder).

Note

When select this submenu, mute the SDI output signal.

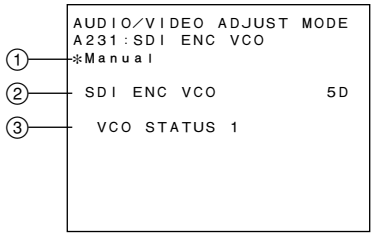
A232 : SDI DEC VCO

This submenu is used for an SDI input interface (SDI decoder).

Note

When select this submenu, mute the SDI input signal.

Description of LCD monitor



Ex. A231 : SDI ENC VCO

① The adjustment mode (manual and automatic) or the messages during automatic adjustment are displayed in this line.

Manual :	Adjustment mode is set to the manual adjustment.
Auto (Push SET Button) :	Press the SET button to initiate the automatic adjustment.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

Note

The adjustment data can be manually changed even if message “Auto (Push SET Button)” is displayed.

② The adjustment item and adjustment data value are displayed in this line.

③ The VCO status is displayed as “0” or “1”.

Change of adjustment mode

The relation between the adjustment mode and display is shown in the table below.

Adj. mode	LCD monitor	Sub LCD
Manual adjustment	Manual	MANUAL
Automatically adjustable	Auto (Push SET Button)	PUSH SET

(i) Turn the JOG dial in REVERSE (↺) direction and move the ✻ mark to line ① on the LCD monitor. (In a sub LCD, “MANUAL” or “PUSH SET” is displayed.)

(ii) Turn the JOG dial while pressing the Search button.
Manual ⇨ Automatic: Search + DIAL (↺)
Manual ⇦ Automatic: Search + DIAL (↺)

To execute the automatic adjustment

(1) Display “Auto (Push SET Button)” on the LCD monitor and “PUSH SET” in the sub LCD referring to the “Change of adjustment mode” on page 2-23.

(2) The automatic adjustment is executed when the SET button is pressed.
- The display on the LCD monitor changes to “Auto Adjusting...”. The displayed data value also changes.
  The display in the sub LCD does not change.

(3) Confirm the automatic adjustment completion and VCO status on the LCD monitor.
- Message “Auto Adjust Complete” is displayed when the automatic adjustment is completed.

Note

A slight time difference may occur from when message “Auto Adjust Complete” is displayed until the VCO status is displayed as “1”.

Note

Refer to the “For Automatic Adjustment Failure” below when message “Auto Adjust Failure” is displayed.

(4) To terminate the menu, press the MENU button.
To execute the automatic adjustment again in this menu, return to step (2).

(5) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

For automatic adjustment failure

It can suppose that there is something wrong with the SDI-23 board.

Caution during manual adjustment

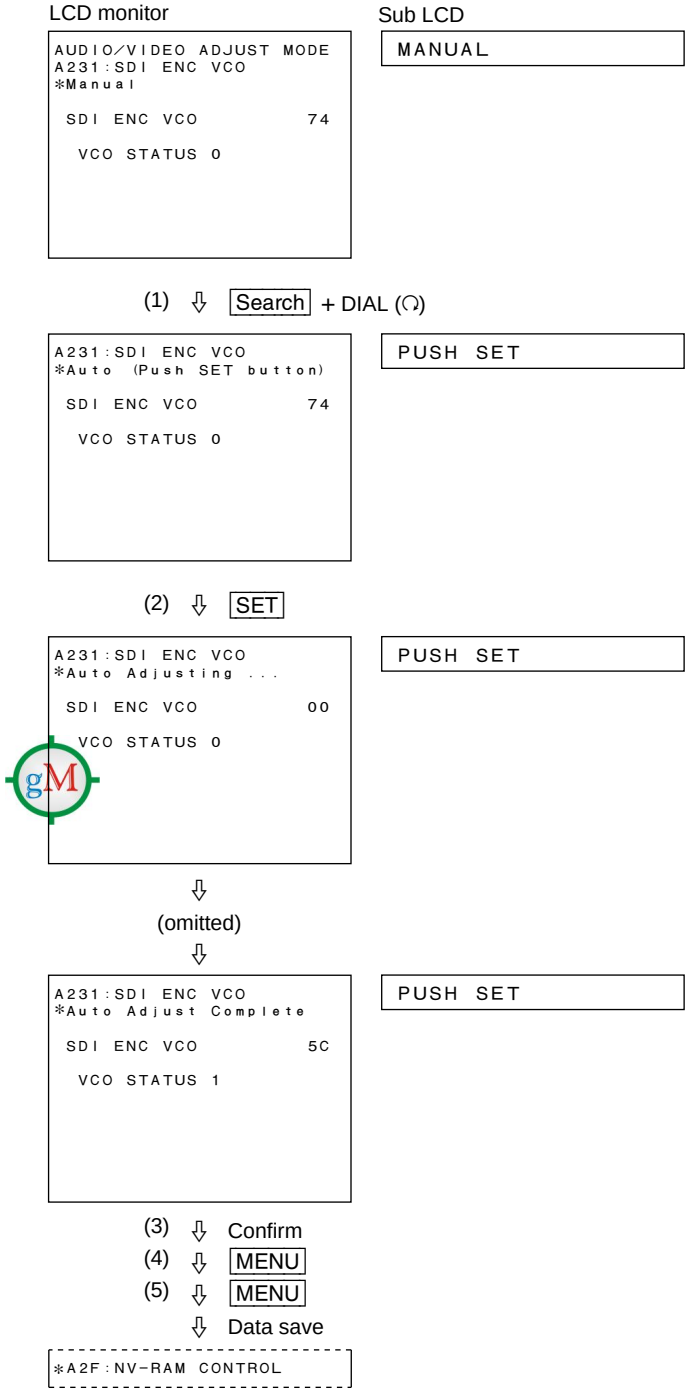
When performing the manual adjustment, set the adjustment data to 27.0 ±0.1 MHz at TP700 on the SDI-23 board (for A231 : SDI ENC VCO) or at TP200 on the SDI-23 board (for A232: SDI DEC VCO) using the frequency counter.

Note

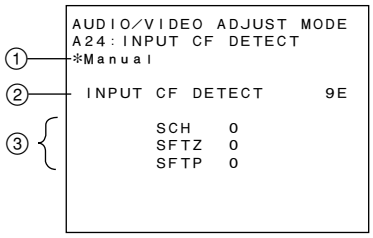
For the manual adjustment, refer to the “To change the adjustment data manually” on page 2-21.

Example of display and operation

Example of A231 : SDI ENC VCO



A24 : INPUT CF DETECT



This menu is used to adjust the color frame detection timing of a composite video input signal.
Preparation (refer to Section 7) is required for the adjustment.

Note

This adjustment is necessary to perform both 525/60 and 625/50 systems.

Description of LCD monitor

① The adjustment mode (manual and automatic adjustments) or the messages during automatic adjustment are displayed in this line.

Manual :	Adjustment mode is set to the manual adjustment.
Auto (Push SET Button):	Press the SET button to initiate the automatic adjustment.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

Note

The adjustment data can be manually changed even if message “Auto (Push SET Button)” is displayed.

② The adjustment item and adjustment data value are displayed in this line.

③ Each status is displayed as “0” or “1”.
0: When the specification is not satisfied
1: When the specification is satisfied
(For SFTP, the status is displayed in alternate “0” and “1” when the specification is satisfied.)

Change of adjustment mode

The relation between the adjustment mode and display is shown in the table below.

Adj. mode	LCD monitor	Sub LCD
Manual adjustment	Manual	MANUAL
Automatically adjustable	Auto (Push SET Button)	PUSH SET

(i) Turn the JOG dial in REVERSE (↺) direction and move the ∗ mark to line ① on the LCD monitor. (In a sub LCD, "MANUAL" or "PUSH SET" is displayed.)
(ii) Turn the JOG dial while pressing the search button.
Manual ⇨ Automatic: [Search] + DIAL (↺)
Manual ⇦ Automatic: [Search] + DIAL (↺)

To execute the automatic adjustment

(1) Display "Auto (Push SET Button)" on the LCD monitor and "PUSH SET" in the sub LCD referring to the "Change of adjustment mode" described above.
(2) The automatic adjustment is executed when the SET button is pressed.
- The display on the LCD monitor changes to "Auto Adjusting...". The displayed data value also changes.
  The display in the sub LCD does not change.

(3) Confirm the automatic adjustment completion and each status on the LCD monitor.
- Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.
  Status for SCH and SFTZ are displayed as "1".
  For SFTP is displayed in alternate "0" and "1".

Note

If the preparation for adjustment is not proper, message "Auto Adjust Failure" is displayed.

(4) To terminate the menu, press the MENU button.
To execute the automatic adjustment again in this menu, return to step (2).
(5) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

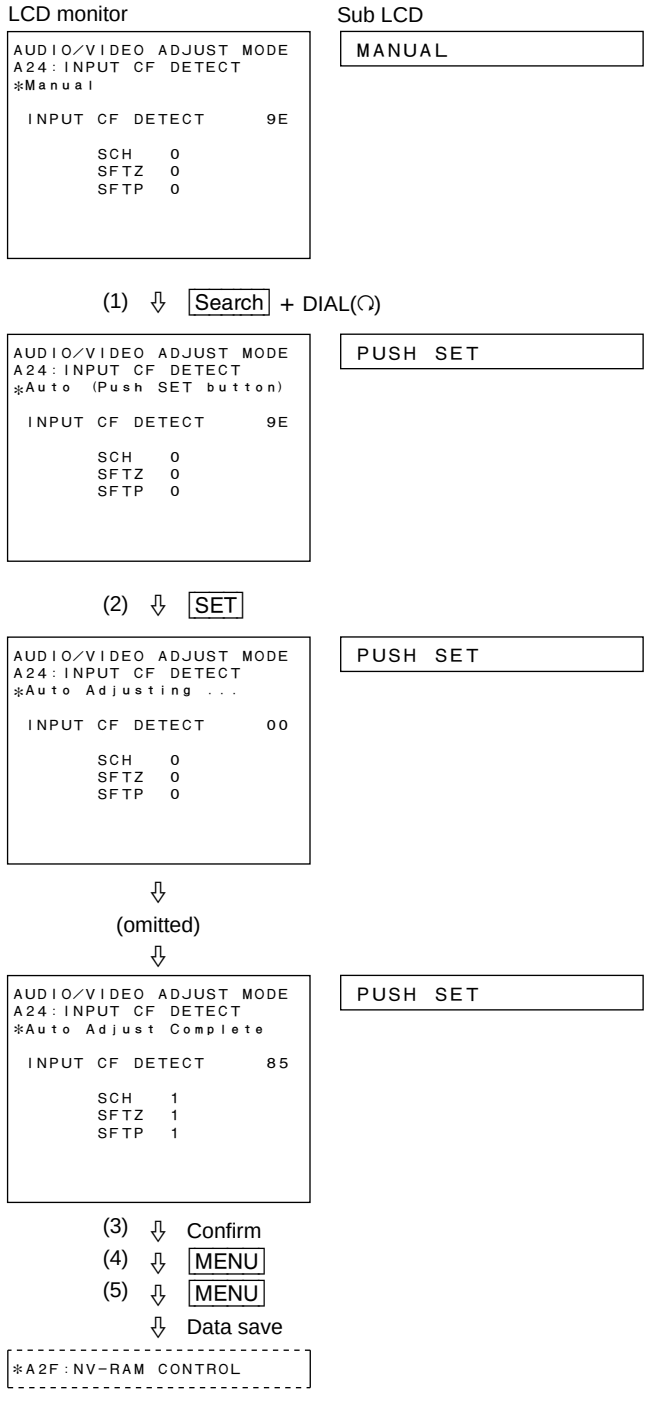
Caution during manual adjustment

Confirm the adjustment data range in which the SCH status is set to "1" and set the adjustment data to the intermediate value when performing the manual adjustment.

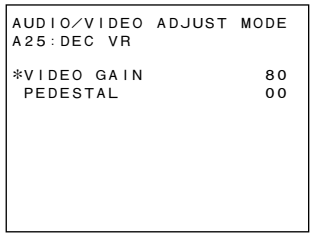
Note

For the manual adjustment, refer to the "To change the adjustment data manually" on page 2-21.

Example of display and operation



A25 : DEC VR



This menu is used to adjust the composite video input system.

Note

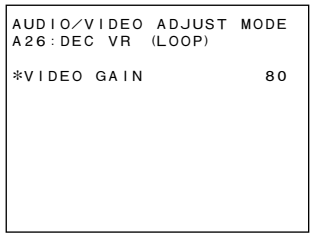
This adjustment is necessary to perform both 525/60 and 625/50 systems.

Adjustment item	Description
VIDEO GAIN	Composite video input level
PEDESTAL	Composite video input pedestal clamp level

Note

The adjustment data in an A25 : DEC VR menu is used in common with the same adjustment item in an A26 : DEC VR (LOOP) menu.

A26 : DEC VR (LOOP)



This menu is used to adjust the composite video input system.
The most suitable signal (refer to the table below) for adjustment is output from an internal video test signal generator, and the composite video input system can be adjusted with the multi-loop function activated.

Note

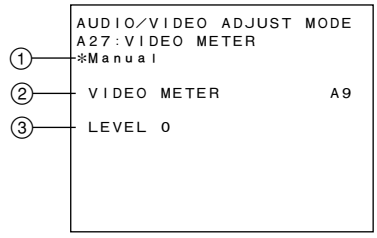
This adjustment is necessary to perform both 525/60 and 625/50 systems.

Adjustment item	Test signal
VIDEO GAIN	100% Color Bars

Note

The adjustment data in an A26 : DEC VR (LOOP) menu is used in common with the same adjustment item in an A25 : DEC VR menu.

A27 :VIDEO METER



This menu is used for the calibration of video meter on the sub LCD.
Before adjustment, inputs the reference video signal to the VIDEO INPUT connector on the rear panel, and set the unit into the EE mode.

Description of LCD monitor

① The adjustment mode (manual and automatic adjustments) or the messages during automatic adjustment are displayed in this line.

Manual :	Adjustment mode is set to the manual adjustment.
Auto (Push SET Button):	Press the SET button to initiate the automatic adjustment.
Auto Adjusting ... :	Automatic adjustment is in progress.
Auto adjust Complete :	Automatic adjustment is completed.
Auto Adjust Failure :	Automatic adjustment fails.

Note

The adjustment data can be manually changed even if message “Auto (Push SET Button)” is displayed.

② The adjustment item and adjustment data value are displayed in this line.

③ When the reference video signel is not input, the message “LEVEL 0” is displayed.

Change of adjustment mode

The relation between the adjustment mode and display is shown in the table below.

Adj. mode	LCD monitor	Sub LCD
Manual adjustment	Manual	MANUAL
Automatically adjustable	Auto (Push SET Button)	PUSH SET

(i) Turn the JOG dial in REVERSE (↺) direction and move the ✻ mark to line ① on the LCD monitor. (In a sub LCD, "MANUAL" or "PUSH SET" is displayed.)
(ii) Turn the JOG dial while pressing the search button.
Manual ⇨ Automatic: Search + DIAL (↺)
Manual ⇦ Automatic: Search + DIAL (↺)

To execute the automatic adjustment

(1) Display "Auto (Push SET Button)" on the LCD monitor and "PUSH SET" in the sub LCD referring to the "Change of adjustment mode" described above.
(2) The automatic adjustment is executed when the SET button is pressed.
- The display on the LCD monitor changes to "Auto Adjusting...". The displayed data value also changes.
  The display in the sub LCD does not change.

(3) Confirm the automatic adjustment completion and each status on the LCD monitor.
- Message "Auto Adjust Complete" is displayed when the automatic adjustment is completed.

Note

If the preparation for adjustment is not proper, message "Auto Adjust Failure" is displayed.

(4) To terminate the menu, press the MENU button.
To execute the automatic adjustment again in this menu, return to step (2).
(5) To save the adjustment data in NV-RAM, execute SAVE ALL ADJUST DATA in an A2F : NV-RAM CONTROL menu.
To return the adjustment data to the state before adjustment, execute ALL DATA PREVIOUS in an A2F : NV-RAM CONTROL menu.

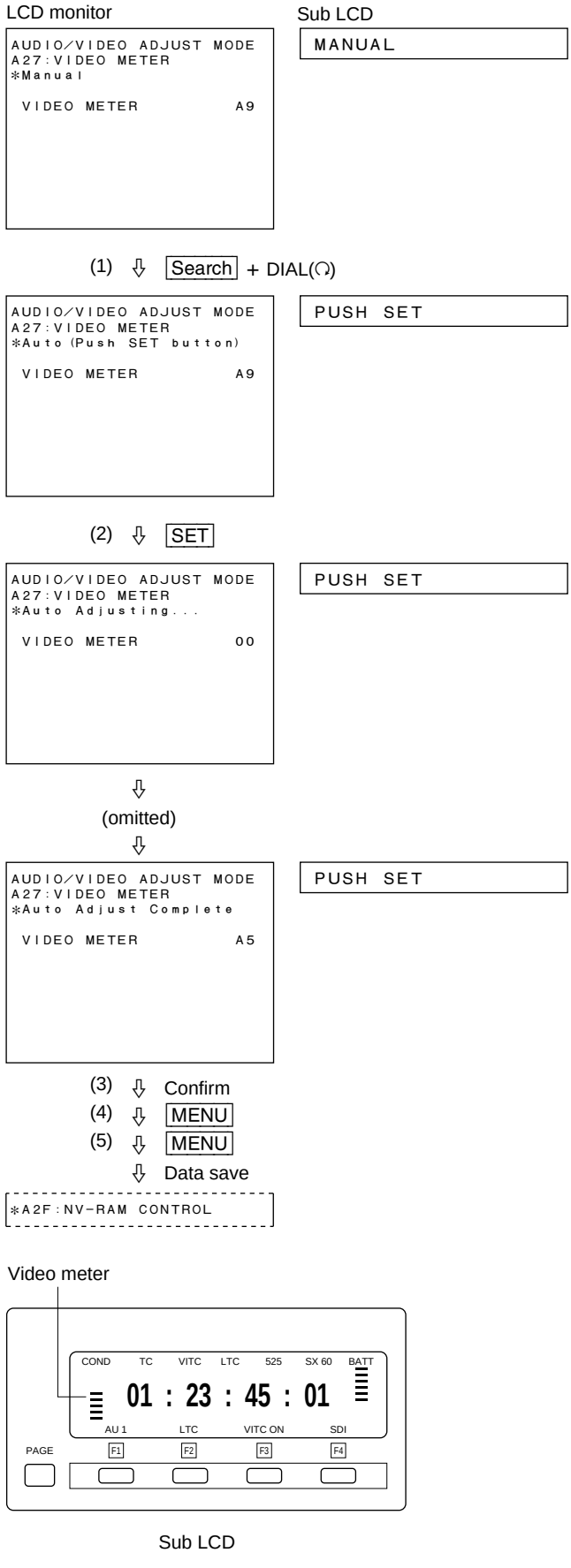
Caution during manual adjustment

Confirm the adjustment data range in which the display of video meter is set to the intermediate value (five lines) when performing the manual adjustment.

Note

For the manual adjustment, refer to the "To change the adjustment data manually" on page 2-21.

Example of display and operation



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A2F : NV-RAM CONTROL

The A2F : NV-RAM CONTROL menu is used to save the audio/video adjustment data adjusted in the AUDIO/ VIDEO ADJUST mode in NV-RAM.
The current adjustment data can return to the state before adjustment when “ALL DATA PREVIOUS” is selected before the adjustment data is saved in the NV-RAM.

Note

When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the menu

(1) Turn the JOG dial and move the ∗ mark on the LCD monitor as described below.
To save the adjustment data after adjustment
⇨ “SAVE ALL ADJUST DATA”
To return to the adjustment data before adjustment
⇨ “ALL DATA PREVIOUS”
- In a sub LCD, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.

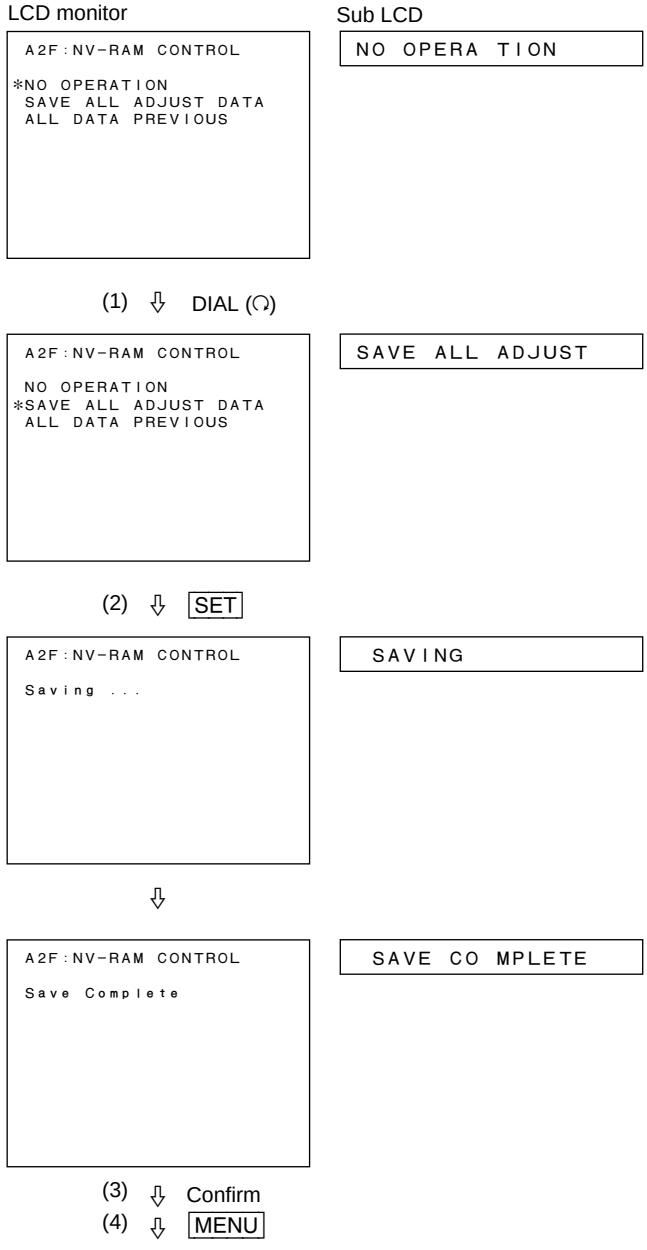
(2) Press the SET button.
- The data transmission is initiated when the SET button is pressed.
- Message “Saving...” or “Loading...” is displayed on the LCD monitor, and message “SAVING” or “LOADING” is displayed in the sub LCD.

(3) Confirm that the data transmission is completed.
- After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the LCD monitor, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the sub LCD.

(4) Press the MENU button to terminate the menu.

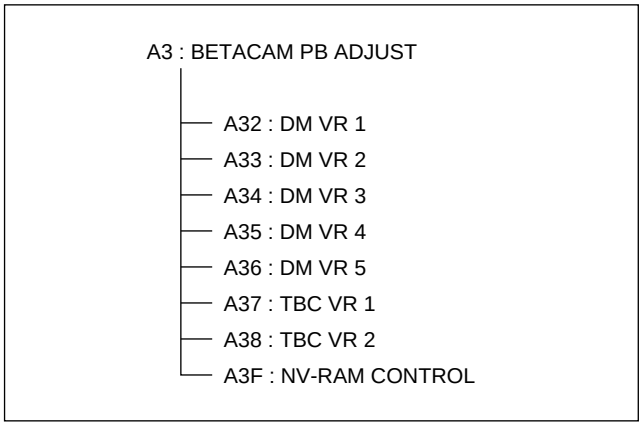
Example of display and operation

(In data save)



2-2-5. BETACAM PB ADJUST Mode (A3)

The A3 : BETACAM PB ADJUST mode is used to adjust the PB system based on a Betacam/Betacam SP format. This unit has the eight menus.



Menu Tree of BETACAM PB Adjustment Mode

CAUTION

Do not change the adjustment data carelessly. This may cause a trouble. For the actual adjustment, refer to the adjustment method described in Section 7.
If you have changed the adjustment data carelessly, execute ALL DATA PREVIOUS in an A3F : NV-RAM CONTROL menu or turn off the power of this unit without selecting an A3F : NV-RAM CONTROL menu.
Never execute SAVE ALL ADJUST DATA.

Note

Betacam/Betacam SP PB function is standard for NTSC (525/60) system.
It is possible to playback simply in other combinations. But the PB picture of the other video system is easily played back by selecting the setup menu.

To change the adjustment data manually

(1) Turn the JOG dial on the LCD monitor and move the ∗ mark to the adjustment item.
Turn the JOG dial in the sub LCD and display the item to be adjusted.
(2) Turn the JOG dial while pressing the search button.
The adjustment data then increases or decreases.

To return the adjustment data to the former state

Execute ALL DATA PREVIOUS in an A3F : NV-RAM CONTROL menu.

Note

The current adjustment data can not return to the former state after executing SAVE ALL DATA ADJUST DATA.

To save the adjustment data

Execute SAVE ALL ADJUST DATA in an A3F : NV-RAM CONTROL menu.

Note

In a sub LCD, the adjustment item name on the LCD monitor is omitted during display as follows:

RF GAIN ⇨ GAIN
GUARD BAND ⇨ GUARD
METAL ⇨ M
OXIDE ⇨ O

A32 : DM VR 1

This menu is used to adjust the frequency characteristics of a primary cosine equalizer (DM-121 board).
There are adjustment items for metal and oxide tapes.
Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

Example of display

```
 BETACAM PB ADJUST MODE
 A32:DM VR 1

*EQ1 METAL-Y-A        7F
 EQ1 METAL-Y-B        81
 EQ1 METAL-C-A        77
 EQ1 METAL-C-B        81
 EQ1 OXIDE-Y-A        AD
 EQ1 OXIDE-Y-B        AF
 EQ1 OXIDE-C-A        94
 EQ1 OXIDE-C-B        9D
```

A33 : DM VR 2

This menu is used to adjust the frequency characteristics of a secondary cosine equalizer (main) (DM-121 board).
There are adjustment items for metal and oxide tapes.
Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

Example of display

```
 BETACAM PB ADJUST MODE
 A33:DM VR 2

*MAIN METAL-Y-A       BC
 MAIN METAL-Y-B       BC
 MAIN METAL-C-A       91
 MAIN METAL-C-B       91
 MAIN OXIDE-Y-A       A8
 MAIN OXIDE-Y-B       A8
 MAIN OXIDE-C-A       A0
 MAIN OXIDE-C-B       A0
```

A34 : DM VR 3

This menu is used to adjust the frequency characteristics of a secondary cosine equalizer (sub) (DM-121 board).
There are adjustment items for metal and oxide tapes.
Each adjustment item is provided proportionally to the number of heads (Y-A, Y-B, C-A, and C-B).

Example of display

```
 BETACAM PB ADJUST MODE
 A34:DM VR 3

*SUB METAL-Y-A        A4
 SUB METAL-Y-B        A4
 SUB METAL-C-A        70
 SUB METAL-C-B        70
 SUB OXIDE-Y-A        B6
 SUB OXIDE-Y-B        B6
 SUB OXIDE-C-A        AA
 SUB OXIDE-C-B        AA
```

A35 : DM VR 4

This menu is used to adjust the guard band width and to set the DC offset level of an over-modulation compensation circuit.
There are adjustment items for metal and oxide tapes.
Each adjustment item is provided proportionally to the number of video channels (Y and C).

Example of display

```
 BETACAM PB ADJUST MODE
 A35:DM VR 4

*GUARD BAND METAL-Y   22
 GUARD BAND METAL-C   1A
 GUARD BAND OXIDE-Y   26
 GUARD BAND OXIDE-C   2F
 OMC DC METAL-Y       E4
 OMC DC METAL-C       D0
 OMC DC OXIDE-Y       D0
 OMC DC OXIDE-C       D0
```

A36 : DM VR 5

This menu is used to adjust the dropout threshold level and to set the RF envelope threshold level.
Metal and oxide tapes are used for the adjustment of a dropout threshold level. The adjustment item is provided proportionally to the number of video channels (Y and C).
Green /yellow (H) and yellow/red (L) limits are used for the setting of an RF envelope threshold level.

Example of display

```
 BETACAM PB ADJUST MODE
 A36:DM VR 5

*DO TH METAL-Y        1A
 DO TH METAL-C        12
 DO TH OXIDE-Y        2E
 DO TH OXIDE-C        27
 ENV-TH-H             20
 ENV-TH-L             10
```

A37 : TBC VR 1

This menu is used to set the read clock timing and the data of a PB VISC phase detection circuit on the DM-121 board.
The adjustment item is provided proportionally to the number of video channels (Y and C) for read clock timing setting.

Example of display

```
 BETACAM PB ADJUST MODE
 A37:TBC VR1

*SQ-Y RZ              4B
 SQ-C-RZ              6F
 VISC PHASE           06
```

A38 : TBC VR 2

This menu is used to set the Y/C delay.
There are adjustment items for metal and oxide tapes.
Each adjustment item is provided proportionally to the number of heads (A and B).

Example of display

```
 BETACAM PB ADJUST MODE
 A38:TBC VR2

*Y/C DELAY METAL-A    36
 Y/C DELAY METAL-B    38
 Y/C DELAY OXIDE-A    8C
 Y/C DELAY OXIDE-B    91
```

A3F : NV-RAM CONTROL

The A3F : NV-RAM CONTROL menu is used to save the Betacam PB adjustment data adjusted in the BETACAM PB ADJUST mode in NV-RAM.
The current adjustment data can return to the state before adjustment when “ALL DATA PREVIOUS” is selected before the adjustment data is recorded in the NV-RAM.

Note

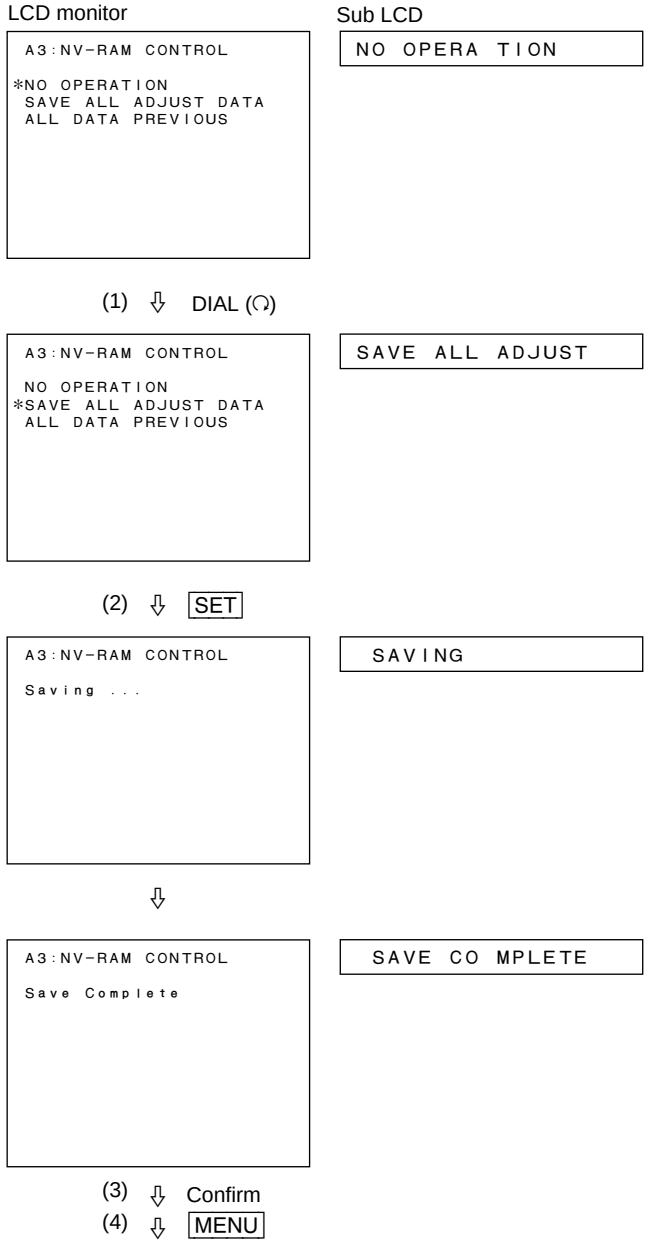
When the adjustment data was not stored in this menu, it returns to the state before adjustment if the power is turned off.

To execute the menu

(1) Turn the JOG dial and move the ∗ mark on the LCD monitor as described below.
   To save the adjustment data after adjustment
   ⇨ “SAVE ALL ADJUST DATA”
   To return to the adjustment data before adjustment
   ⇨ “ALL DATA PREVIOUS”
   • In a sub LCD, “SAVE ALL ADJUST DATA” and “ALL DATA PREVIOUS” are displayed as messages “SAVE ALL ADJUST” and “ALL DATA PREVIOUS”, respectively.
(2) Press the SET button.
   • The data transmission is initiated when the SET button is pressed.
   • Message “Saving...” or “Loading...” is displayed on the LCD monitor, and message “SAVING” or “LOADING” is displayed in the sub LCD.
(3) Confirm that the data transmission is completed.
   • After data transmission is completed, message “Save Complete” or “Load Complete” is displayed on the LCD monitor, and message “SAVE COMPLETE” or “LOAD COMPLETE” is displayed in the sub LCD.
(4) Press the MENU button to terminate the menu.

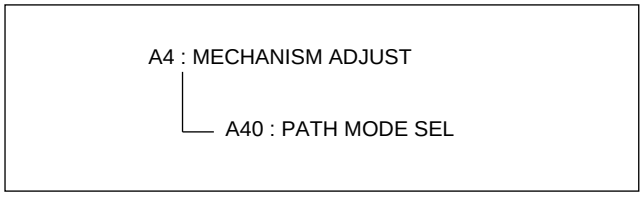
Example of display and operation

(In data save)



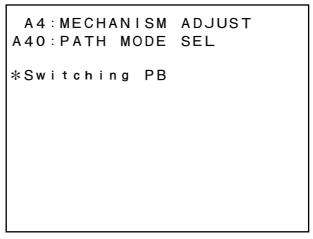
2-2-6. MECHANISM ADJUST Mode (A4)

The A4 : MECHANISM ADJUST mode is used to adjust the mechanism. This mode contains the one menu below.



Menu Tree of MECHANISM Adjustment Mode

A40 : PATH MODE SEL



This menu sets the PB mode for confirming and adjusting video tracking. Switching PB and full PB modes are available for setting.
A PB signal is output to the test point (TP101) on the SV-206 board by the REC head when the tape is played back with this menu opened. (The signal output from this test point becomes an envelope waveform.)
In the switching PB mode, only the helical track is played back.
In the full PB mode, the overlap portion before and behind the helical track is played back.
The switching PB mode is always set when the menu is opened.

PB mode setting

To set the PB mode, turn the JOG dial while pressing the search button and display the desired setting.

Menu operation

A white square is displayed in the upper-right position of the LCD monitor when the SET button is pressed after the switching PB and full PB modes are set. The unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed.)
In this state, play back the specified alignment tape, and confirm and adjust the video tracking.
However, character information (time code or operation status) superimposed during ordinary operation is not displayed.
To return to the former state, press the MENU button.

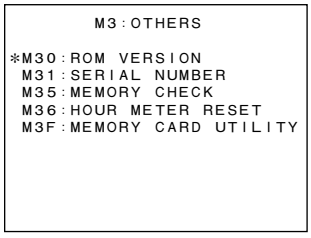
Note

For the video tracking confirmation and adjustment, refer to “5-5. Video Tracking Confirmation and Adjustment”.

2-3. OTHERS CHECK Mode (M3)

2-3-1. Outline

The OTHERS check mode is used for other checks. This unit has the four menus and one submode (M3F) below.



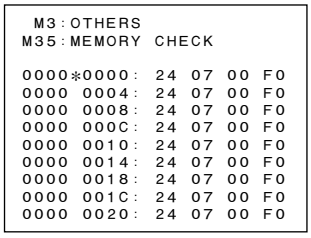
OTHERS CHECK mode

Title	Page	Description
M30 : ROM VERSION	—	Displays the unit's model name and ROM version. (Refer to the maintenance manual part 1.)
M31 : SERIAL NUMBER	—	Displays and corrects the serial number of this unit. (Refer to the maintenance manual part 1.)
M35 : MEMORY CHECK	2-36	Displays the data in ROM. (Used for check at the factory.)
M36 : HOUR METER RESET	—	Displays and resets the resettable hours meter and thread counter. (Refer to the maintenance manual part 1.)
M3F : MEMORY CARD UTILITY	—	Uploads and downloads the software using the memory card box.

Note

This unit is not ready for "M3F : MEMORY CARD UTILITY" yet.

2-3-2. MEMORY CHECK Display Menu (M35)



This menu displays the ROM data installed in this unit in hexadecimal.

Note

This menu is used for inspection at the factory.

Menu operation

Turn the JOG dial to move the * mark upward or downward. The address and data display portions are then scrolled.
Turn the JOG dial while pressing the search button: The address then changes 100H at a time.
Turn the JOG dial while pressing the VAR button: The address then changes 10000H at a time.
Turn the JOG dial while pressing the search and VAR buttons simultaneously: The address then changes 1000000H at a time.
The contents of the *-marked line on LCD monitor are displayed in a Sub LCD area.

Note

A white square is displayed in the upper-right position of the LCD monitor when the SET button is pressed. This unit then enters the ordinary operation state (in which the ordinary operation of this unit except a menu system can be performed).
However, the character information (time code or operation status) superimposed during ordinary operation is not displayed.
To return to the former state, press the MENU button.

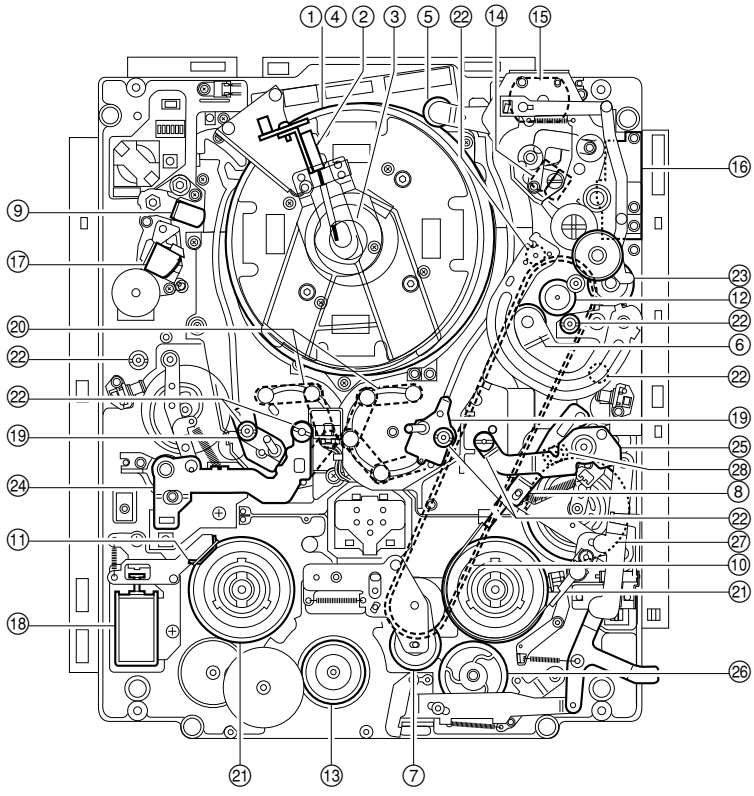
Section 3
Replacement of Periodic Maintenance Parts

3-1. General Information on Parts Replacement and Alignment

Reference

In the part replacement described in this section, parts can be replaced with the mechanical deck assembly installed in the main unit unless otherwise specified.
In the figures shown in this section, the main unit's frame is omitted.

3-1-1. Index



No.	Part name	Reference
1.	Upper drum assembly	3-2
2.	Brush for slip ring	3-3
3.	Slip ring assembly	3-4
4.	Drum assembly	3-5
5.	Video head cleaner	3-6
6.	Pinch roller	3-7
7.	Swing gear	3-8
8.	Tension regulator band	3-9
9.	CTL head	3-10
10.	Timing belt	3-11
11.	S main brake shoe	3-12
12.	Capstan motor	3-13
13.	S reel motor	3-14
14.	AT head	3-15

No.	Part name	Reference
15.	Threading motor	4-1*
16.	Gear box	4-2*
17.	Full erase head	4-3*
18.	S brake solenoid	4-4*
19.	S/T slider	4-5*
20.	Threading link	4-6*
21.	S/T reel table	4-7*
22.	Tape guide	4-8*
23.	Pinch press cam	4-9*
24.	S tension regulator arm	4-10*
25.	T tension regulator arm	4-11*
26.	T idler	4-12*
27	Cam gear	4-13*
28	Intermittent gear	4-14*

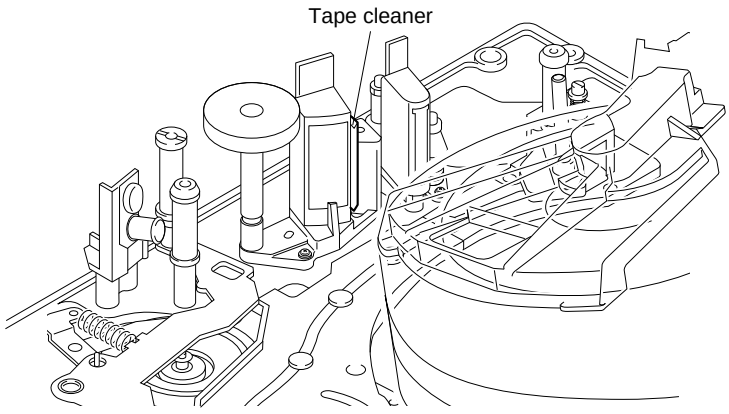
* : Refer to the Mechanical Part Replacement in Section 4.

3-1-2. Precautions

1. Tape cleaner

WARNING

Never contact the tape cleaner on the entrance head block with bare hands.
The tape cleaner has a sharp edge. Pay careful attention when replacing or adjusting the peripheral parts.



2. Tool cleaning

Clean the surface of tools before using them.

- Cleaning cloth (15 cm × 15 cm) : 3-184-527-01
- Cleaning liquid: 9-919-573-01

Take care not to damage the tool when handling it.
If damaged tool is used, the correct adjustment may not be carried out.

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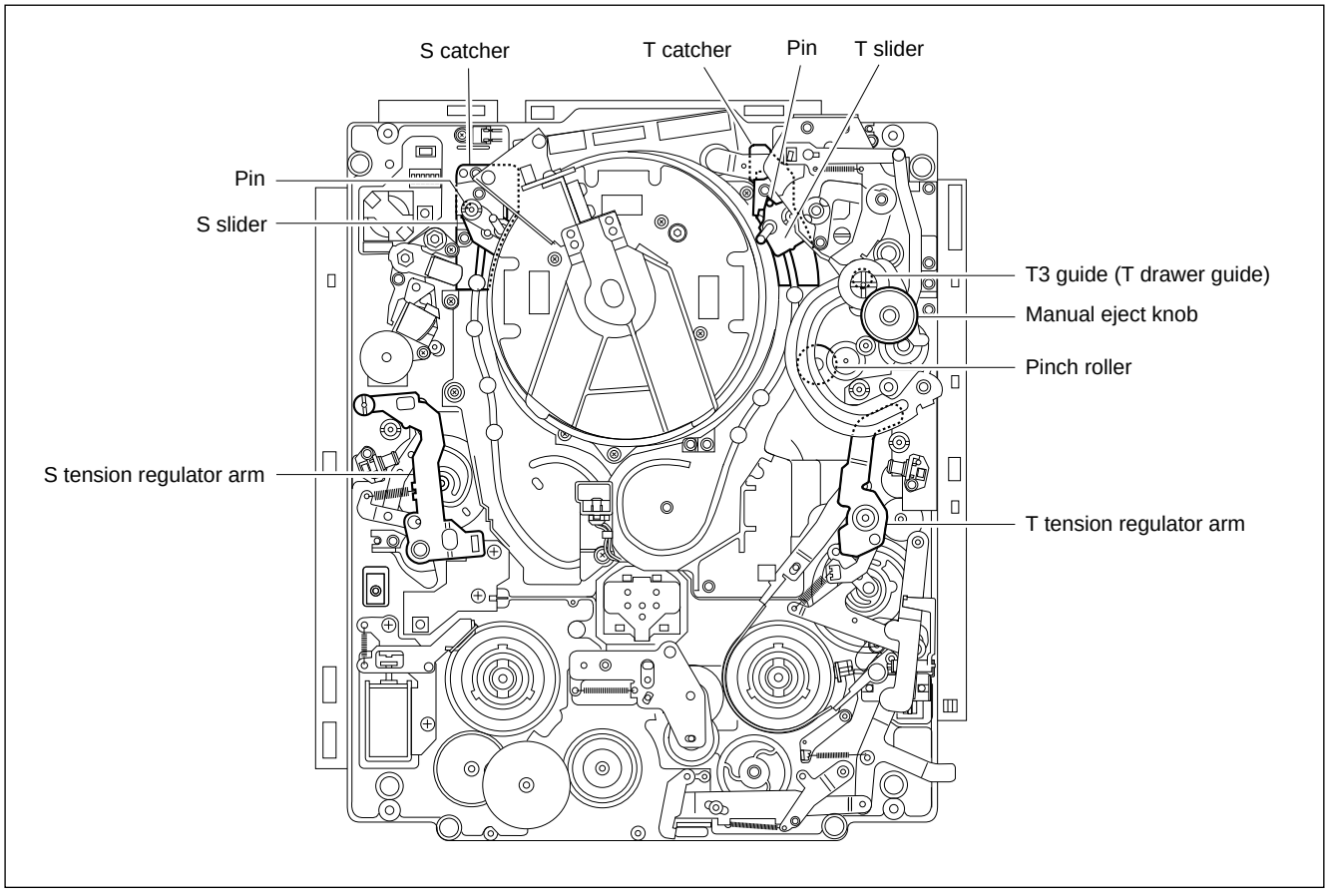
3-1-3. Threading End and Unthreading End States

1. Threading end state

In the threading end state, the S and T sliders move from the reel table side to both sides of the drum and the pins of the S and T sliders stop in the V grooves of each catcher. At the same time, the S tension regulator arm, T3 guide, pinch roller, and T tension regulator arm move to the positions shown in the figure.



To enter the threading end state using tape

(1) Turn on the power.
(2) Insert a cassette tape into the cassette compartment.
(3) Close the control panel or cassette compartment.

To enter the threading end state manually

Turn the manual eject knob clockwise.

Note

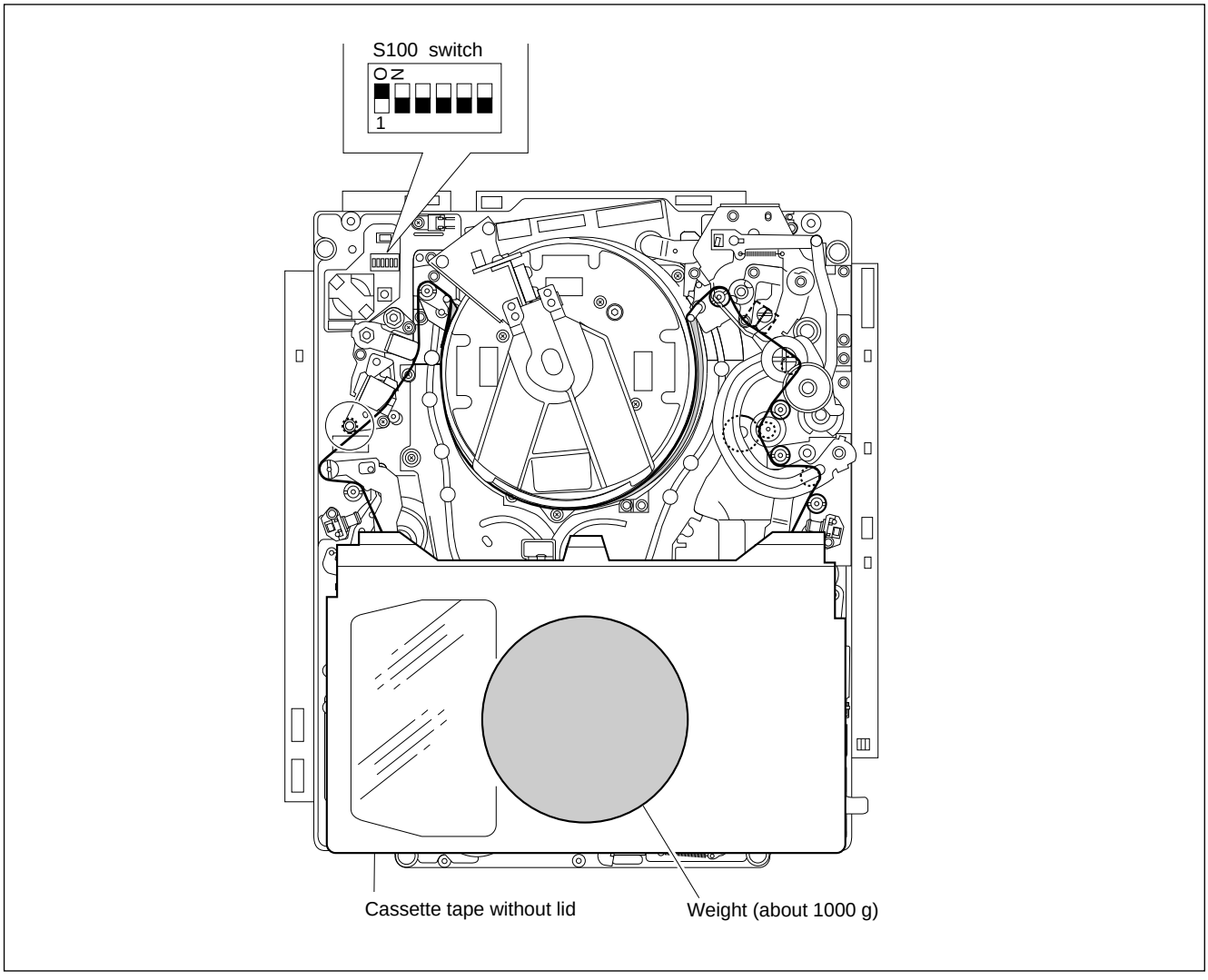
Stop the rotation of the manual eject knob if the mechanical deck is in the above mentioned threading end state. If not, the related gears may be damaged.

To enter the threading end state with the cassette compartment removed (during tape path adjustment)

(1) Set switch S100-1 on the SV-206 board to ON.
(2) Turn on the power.
(3) Press the EJECT button. (If not, an error will be detected due to the threading end state.)
(4) Press the STOP button.
(5) Put the cassette tape without lid on the mechanical deck and put a weight.

Reference

- Use a weight of about 1000 g.
- As for how to remove a lid from the cassette tape, refer to section 5-1.



2. Unthreading end state

In the unthreading end state, the S and T sliders move from the S and T catchers to the reel table side, and then stop. At the same time, the S tension regulator arm and T tension regulator arm are located in the positions shown in the figure. This state is the same as the standby.

To enter the unthreading end state with the cassette compartment removed

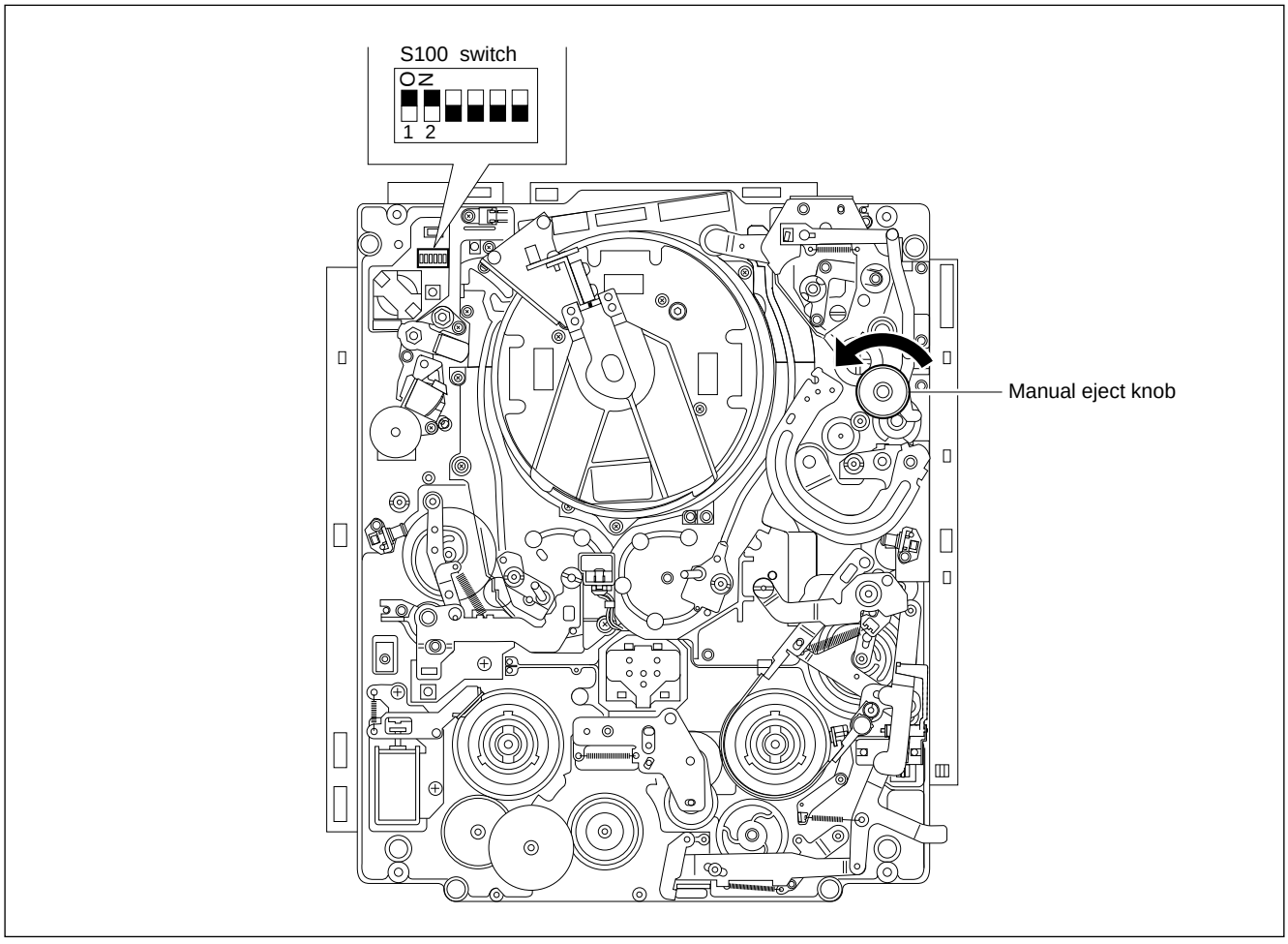
(1) Set switch S100-1 on the SV-206 board to ON.
(2) Turn on the power.
(3) Press the EJECT button.

To enter the unthreading end state manually

Turn the manual eject knob counterclockwise.

Notes

- Stop the rotation of the manual eject knob if the mechanical deck is in the unthreading end state as shown in the figure. If not, related gears may be damaged.
- As for how to enter the unthreading end state with the cassette tape inserted, refer to the maintenance manual Part 1, Section 1-11.

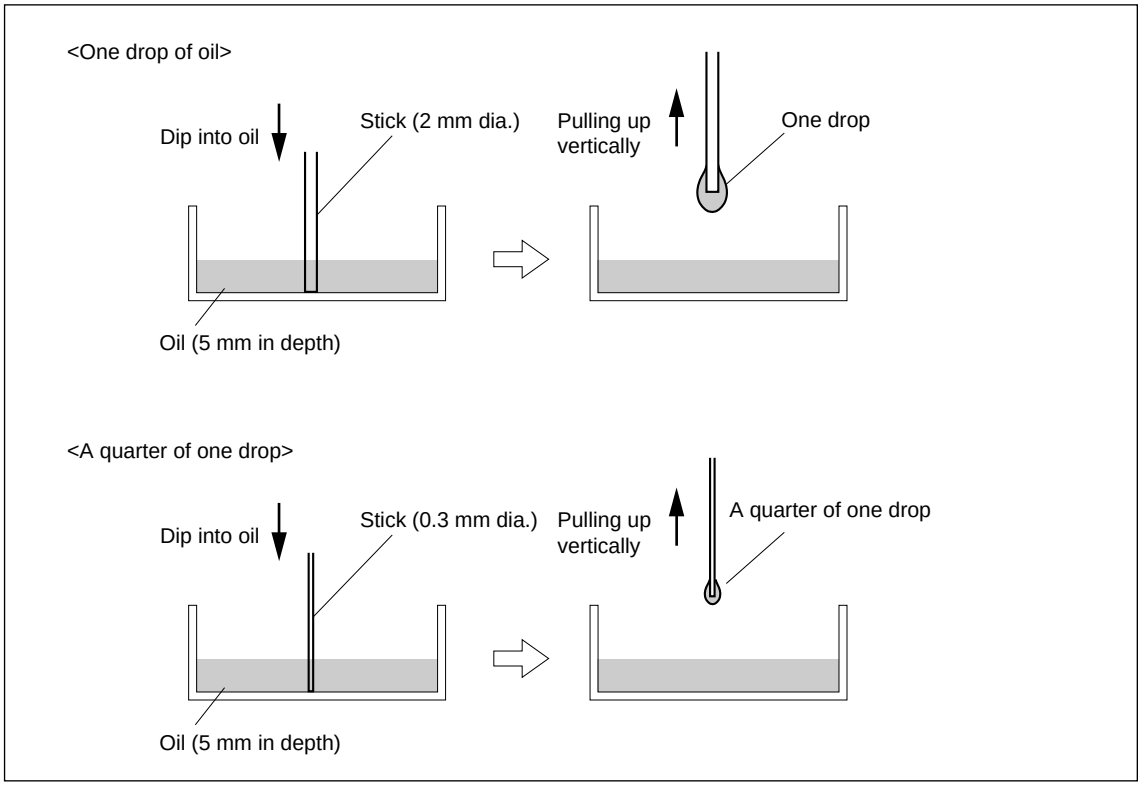


3-1-4. Oil and Grease

Be sure to use the specified oil and grease.
If not, a serious failure may occur in the unit because of difference in viscosity and components.
Do not use oil or grease in which dust is mixed. This may also cause a serious failure.
The oil and grease used in this model are as follows:

Oil:	7-661-018-18
Grease (SGL-601):	7-651-000-10
Grease (SGL-801):	7-651-000-11
Grease (PG-662):	7-651-000-59

- Oil of one drop indicates the amount at the tip of a stick with diameter of 2 mm shown in the figure. Oil of a quarter of one drop indicates the amount at the tip of a stick with diameter 0.3 mm shown in the figure. Applying oil described in this manual means this a quarter drop of oil applying.
- Apply grease on the surface of the part like a thin film. If grease smeared apart from the relevant areas, be sure to wipe using a gauze or soft cloth.
- Apart from the relevant areas never use oil and grease.



3-1-5. Tightening Torque and Washer

1. Tightening torque and screwdriver

This model uses many M1.4 and M2 screws.
Be sure to use the specified tool when loosening or tightening these screws.
Use a torque screwdriver and tighten the screws with the specified tightening torque.

Torque screwdriver bit (for M1.4): J-6325-110-A
Torque screwdriver bit (for M2): J-6325-380-A
Hexagon bit (Across flat has 1.5 mm): J-6326-120-A
Torque screwdriver (for 3 kg): J-6325-400-A

Tightening torque

For M1.4 screw: 9×10^{-2} N•m (0.9 kgf•cm)
For M2 screw: 20×10^{-2} N•m (2.0 kgf•cm)

Reference

This model uses small-sized screws. Be careful not to drop these screws in the unit during removal and reinstallation. We recommend to magnetize the screwdriver bit to prevent that the screws drop.

2. Stop washer and E ring

Do not re-use the stop washer and E ring after removing them. Be sure to use a new stop washer and E ring when installing parts.

Stop washer: 3-559-408-11
E ring(2.3): 7-624-105-04

Removing the stop washer and E ring

Remove the stop washer and E ring using small pliers or tweezers.

Notes

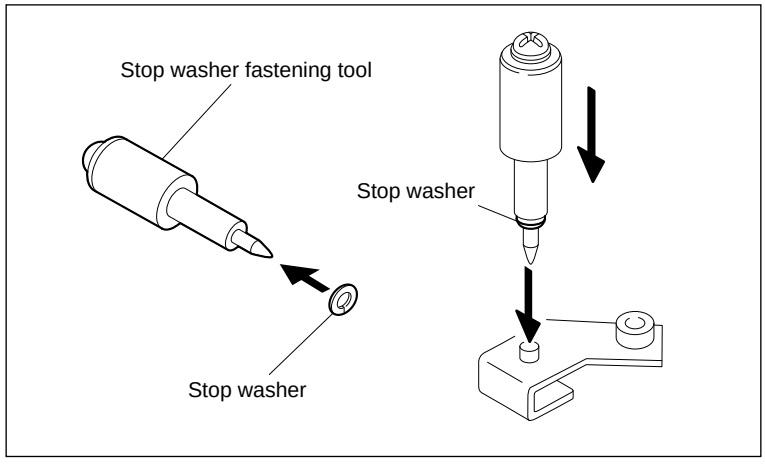
- Be careful not to drop the stop washer and E ring in the unit.
- Take care that the tool does not touch other parts, especially, the drum.

Installing the stop washer

It is recommended to use the tool below when installing the stop washer.

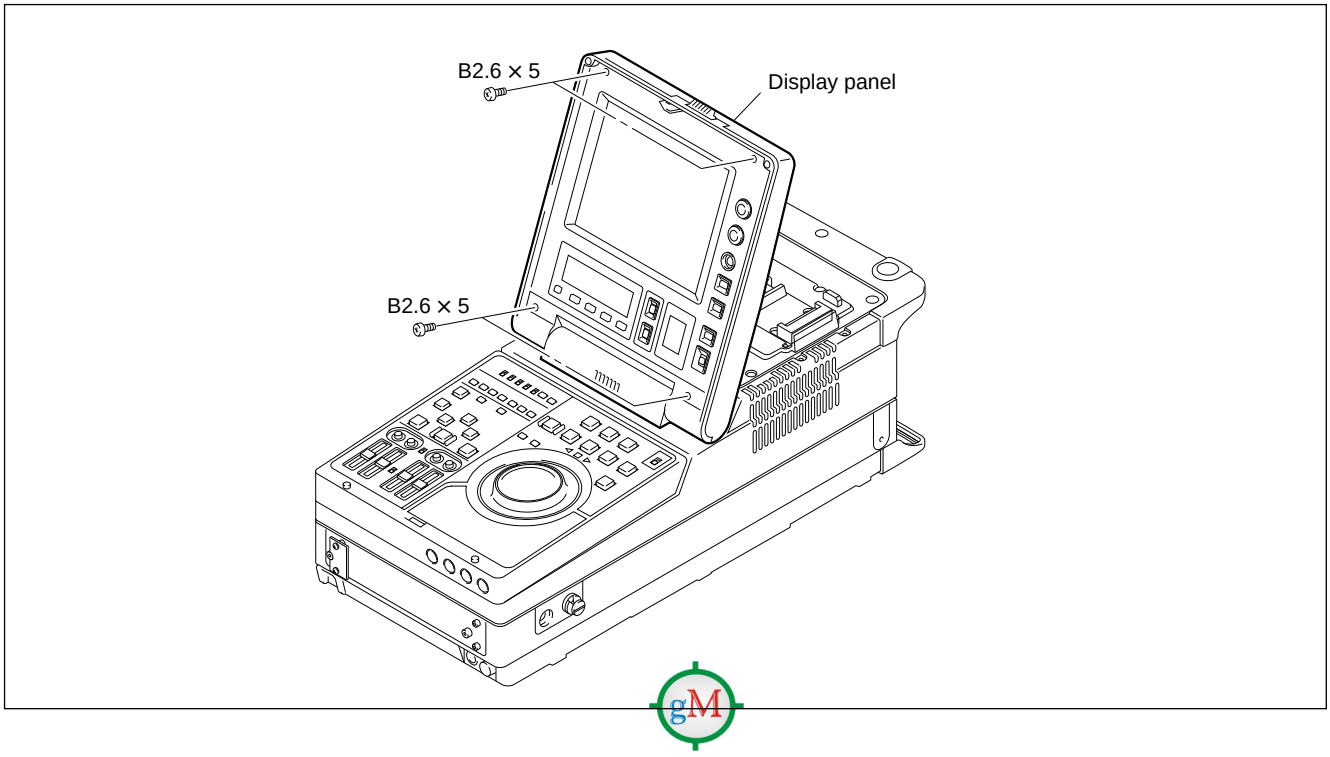
Stop washer fastening tool: J-6323-530-A

(1) Insert a stop washer into the thin tip of a stop washer fastening tool.
(2) Put the thin tip of the tool on the top of the shaft to be installed in a upright position.
(3) Push the tool downward and install the stop washer to the shaft.

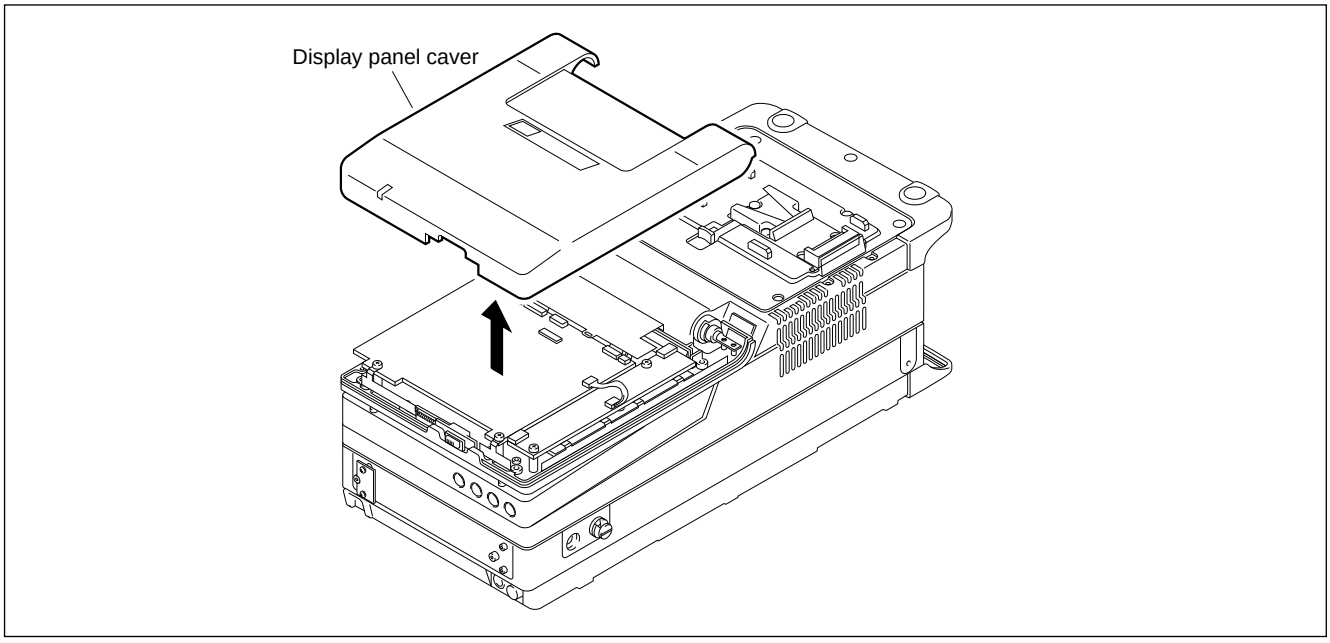


3-1-6. Display Panel Cover Removal and Installation

1. Open the display panel.
2. Remove the four screws fixing the display panel cover.



3. Close the display panel once, then remove the display panel cover in the upper direction.



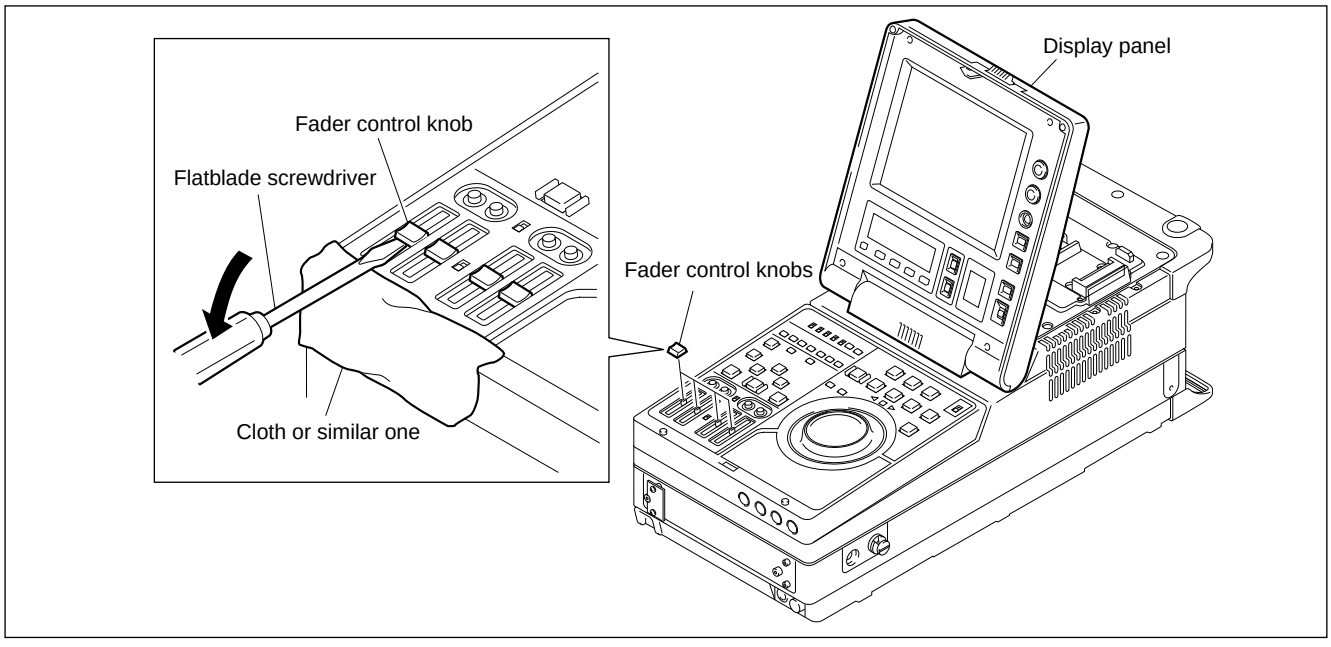
4. Reinstall the display panel cover in the reverse order of removal.

Note

Being careful not to pinch the harnesses nearby the inverter, reinstall the panel.

3-1-7. Control Panel Removal and Installation

1. Open the display panel.
2. Remove the fader control knobs as shown in the figure.

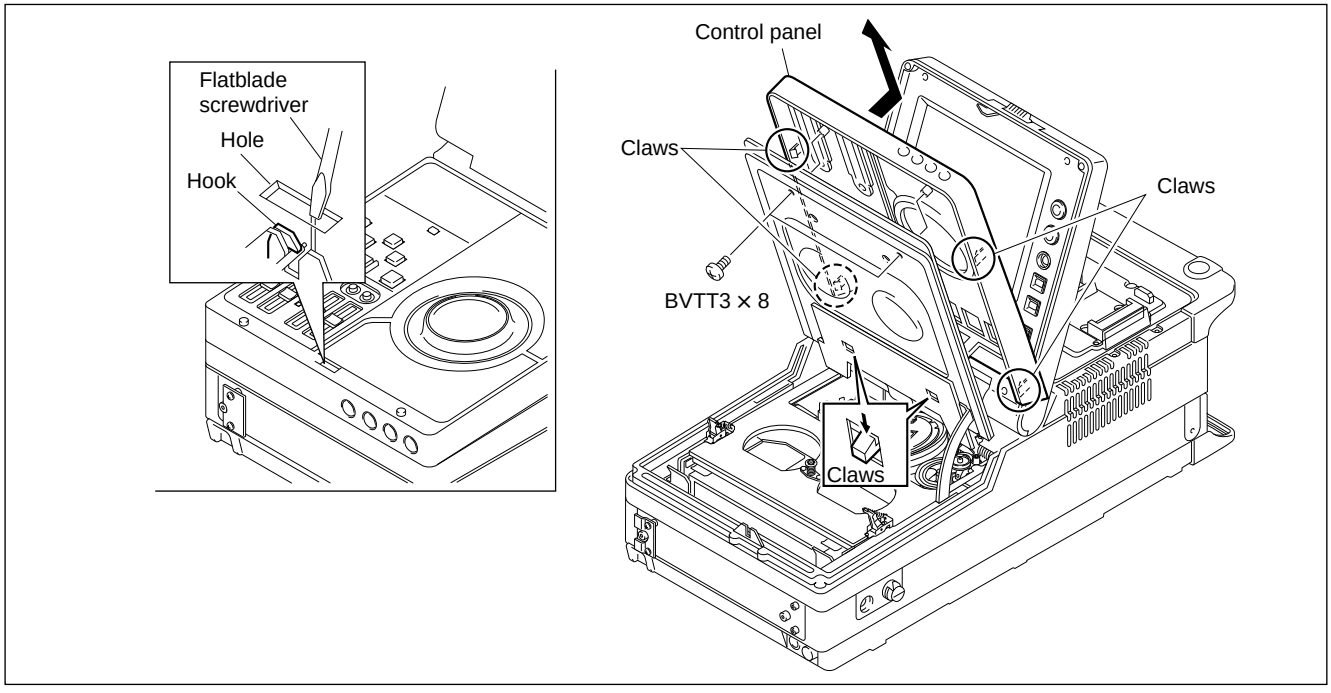


3 Insert a screwdriver into the square hole on the control panel, and unhook. Open the control panel.
4. Remove the two screws fixing the control panel.

Note

Be careful no to drop the removed screws in the mechanical deck assembly.

5. Remove the six claws on the control panel, then remove the control panel in the direction indicated by the arrow.



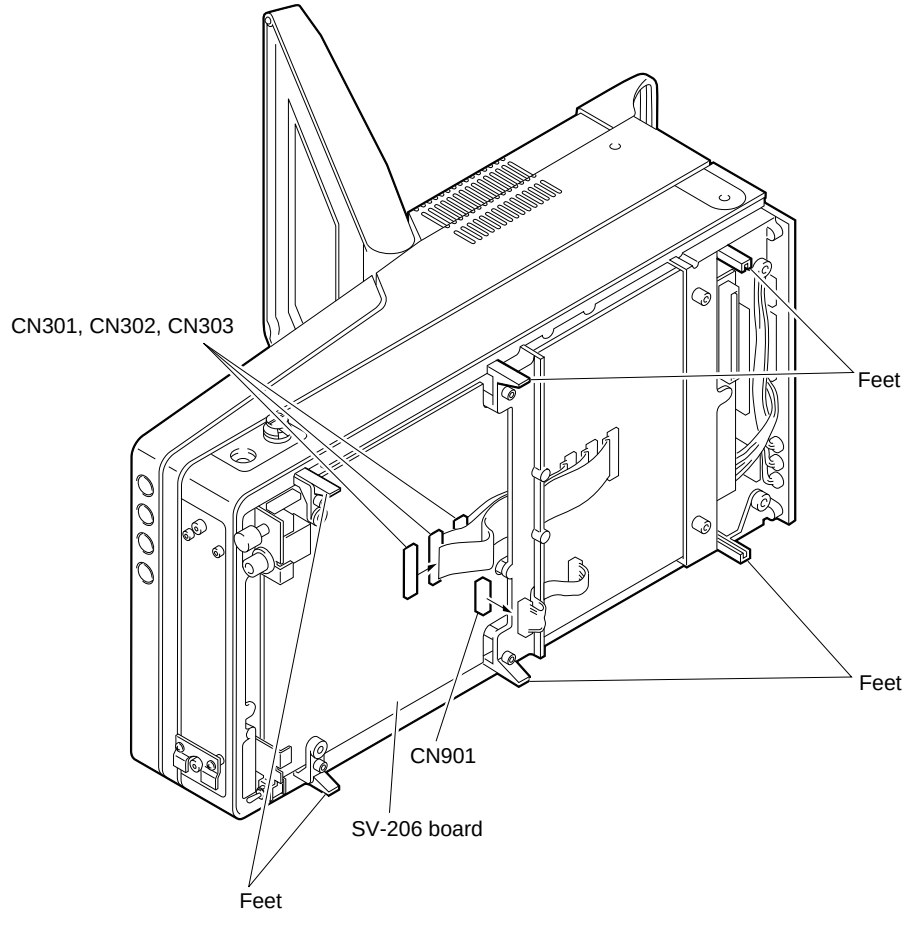
6. Install the control panel in the reverse order of removal.

3-1-8. Mechanical Deck Assembly Removal and Installation

1. Remove the bottom plate. (Refer to the maintenance manual Part 1, Section 1-6.)
2. Remove the DM-121 board. (Refer to the maintenance manual Part 1, Section 1-8.)
3. Disconnect three flexible card wires from the connectors (CN301, CN302, and CN303) on the SV-206 board.
4. Disconnect the harness from the connector (CN901) on the SV-206 board.
5. Put the unit back to the original position.

Reference

The frame has four feet, therefore, the unit can be put the original position even if there is no bottom plate.



6. Remove the battery subpanel. (Refer to the maintenance manual Part 1, Section 1-6.)
7. Remove the upper frame. (Refer to the maintenance manual Part 1, Section 1-6.)
8. Disconnect the three harness connectors from the drum assembly board as shown in the figure.
9. Disconnect the brush harness from the connector.
10. Pull the AU-262 board out, and then disconnect the AT head harness from the connector (CN300) on the AU-262 board.
11. Loosen the four hexagon cap screws fully shown in the figure.

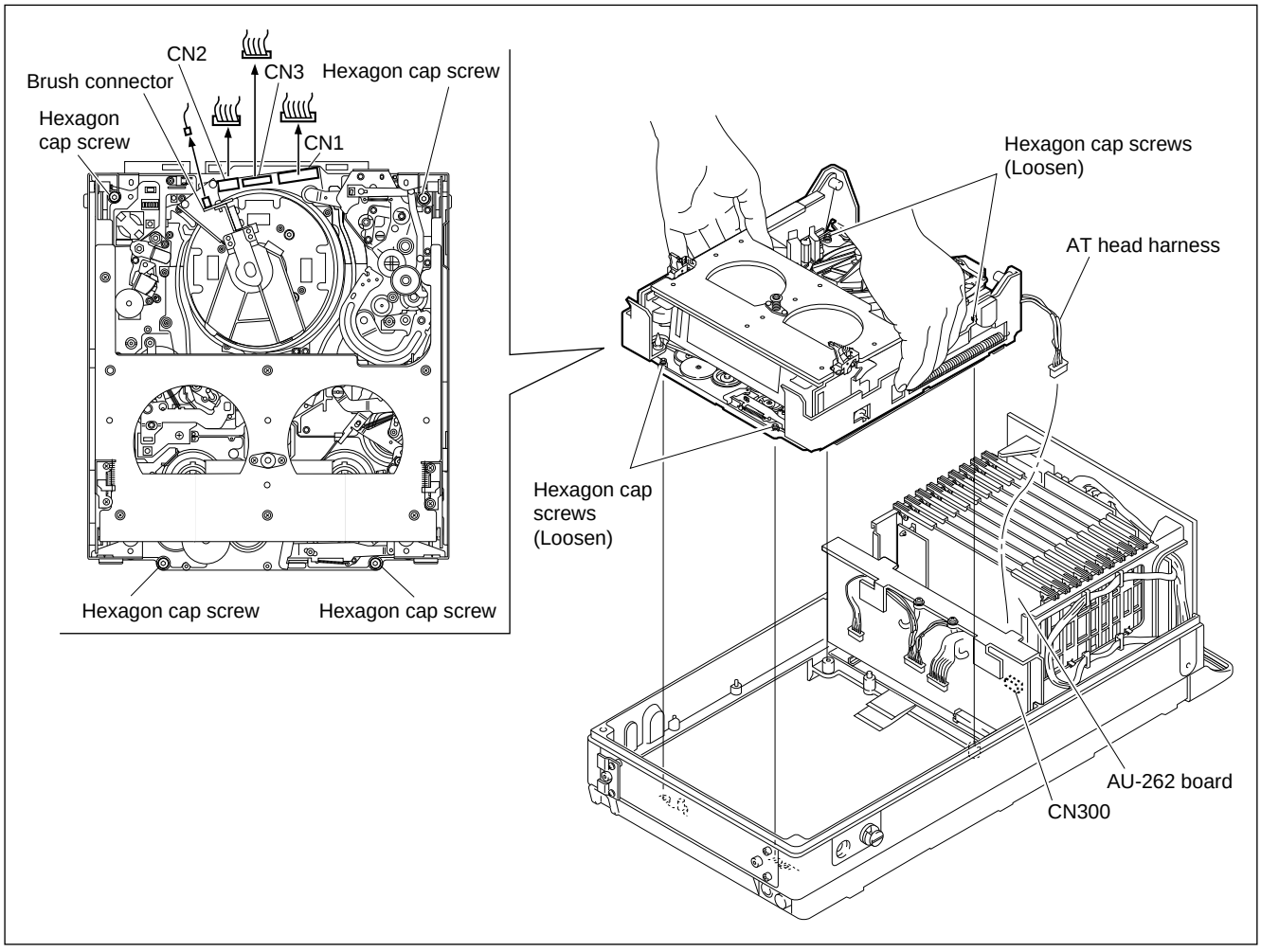
    Note

    Each screw has a stopper to prevent it from being removed.

12. Lift the mechanical deck out while grasping it by the cassette compartment.

    Notes

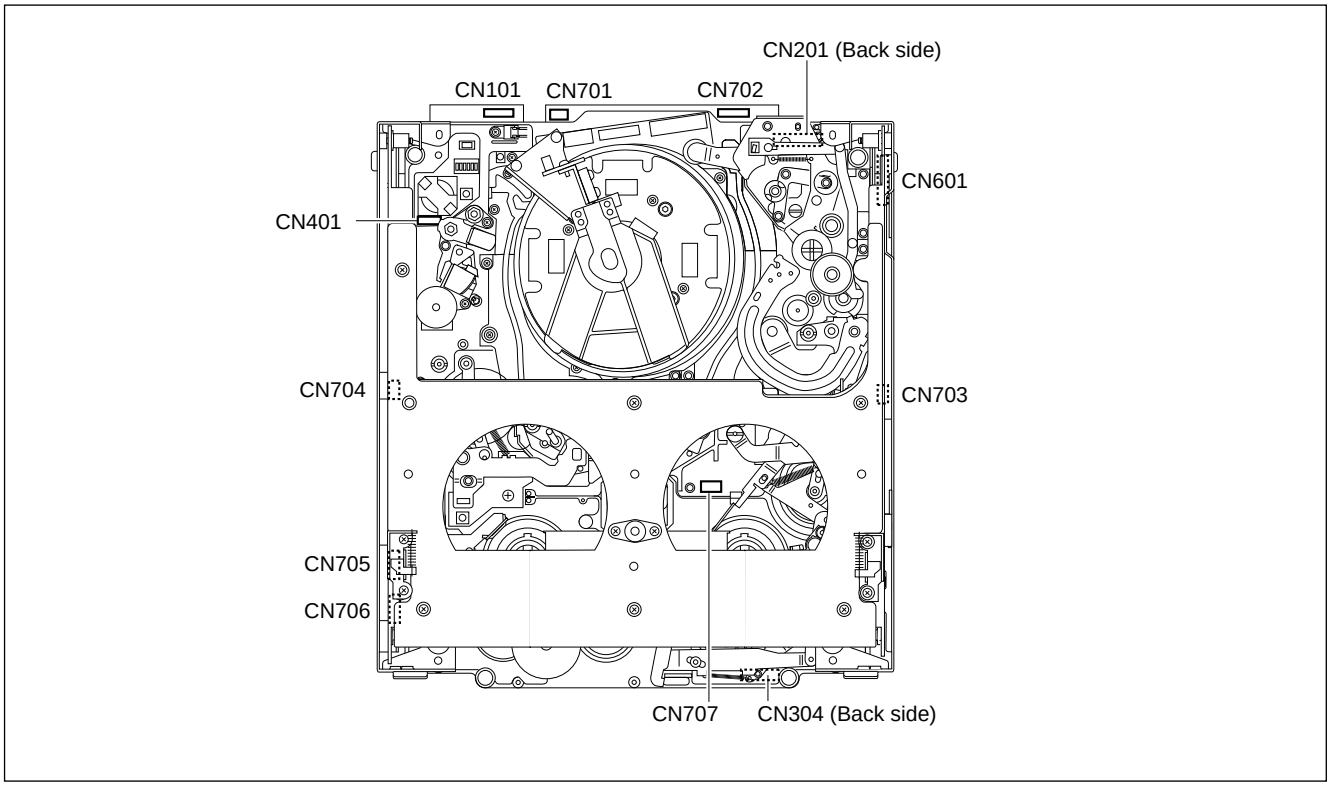
    - Put the mechanical deck on a soft cushion (e.g., sponge). Particularly, be careful not to apply excessive force to the hybrid IC on the SV-206 board faces up
    - When the unit is placed that the SV-206 board faces up, it is recommended to attach the cassette compartment to the unit. The drum is protected by the cassette compartment and manual eject knob.



13. Disconnect the harness from the connectors on the SV-206 board below.
    - CN101 (Drum SV harness)
    - CN701 (Dew condensation sensor harness)
    - CN702 (Threading motor harness)
    - CN601 (AT head harness)
    - CN201 (Capstan motor harness)
    - CN703 (Tape top sensor harness)
    - CN304 (S reel motor harness)
    - CN706 (Brake solenoid harness)
    - CN705 (Tension sensor harness)
    - CN704 (Tape end sensor harness)
    - CN401 (Entrance head harness)
    - CN707 (Full top sensor harness)

    Reference

    Remove the cassette compartment once during harness removal. This facilitates the removal operation.



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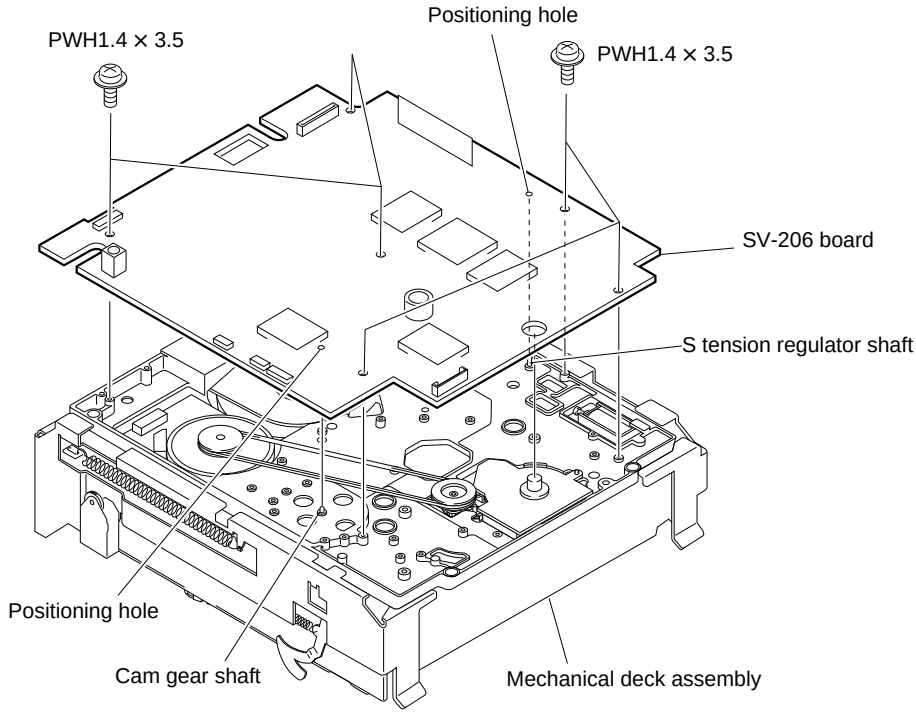
14. Remove the six screws, then remove the SV-206 board.



15. Reinstall the mechanical deck assembly in the reverse order of removal.

Note

Perform the confirmation or adjustment below after the mechanical deck assembly is removed and installed.

- Tape running check or adjustment
- Video tracking check or adjustment
- CTL head position check or adjustment
- AT head position check or adjustment

3-2. Upper Drum Assembly Replacement

Outline

Replacement

Brush cover removal
Brush assembly removal
Slip ring assembly removal
Upper drum assembly removal
Installation surfaces cleaning
Upper drum assembly installation
Slip ring assembly installation
Brush assembly installation
Brush cover installation
Video head and tape running surfaces cleaning

Adjustment after replacement

Video tracking adjustment
CTL head position adjustment
AT head position adjustment
Drum phase adjustment
PB system adjustment
REC system adjustment

Precaution

Replace the upper drum assembly when the video heads are worn or damaged. Only the head chip cannot be replaced independently.

Basic knowledge

For except the periodic replacement, replace the upper drum in the following case.

- When no proper RF waveform is obtained even if the tracking adjustment is performed

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame. (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.

Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Hexagon bit (Across flat has 1.5 mm): J-6326-120-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- L-shaped wrench (Across flat has 1.5 mm): 7-700-736-05
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Removal

1. Brush cover removal

Remove the brush cover. (Refer to Section 3-3.)

2. Brush assembly removal

Remove the brush assembly.
(Refer to Section 3-3.)

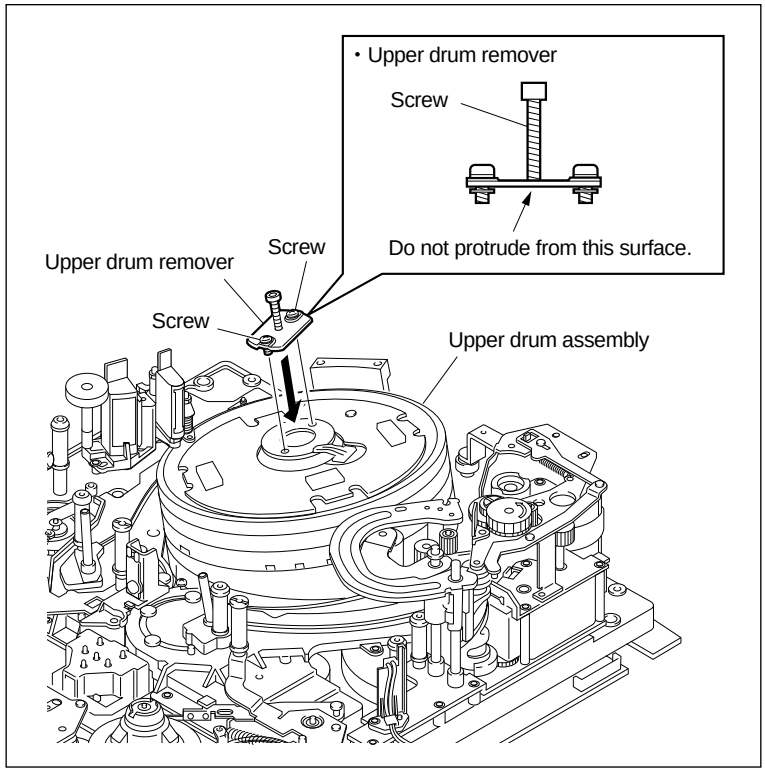
3. Slip ring assembly removal

Remove the slip ring assembly.
(Refer to Section 3-4.)

4. Upper drum assembly removal

(1) Prepare the upper drum remover supplied with a new upper drum assembly.
Loosen the screw of the upper drum remover while taking care that it does not protrude from the installation surface.

(2) Install the upper drum remover to the upper drum assembly with two screws.



(3) Insert the L-shaped wrench into the holes on the upper drum assembly board and loosen the four screws fully fixing the upper drum.

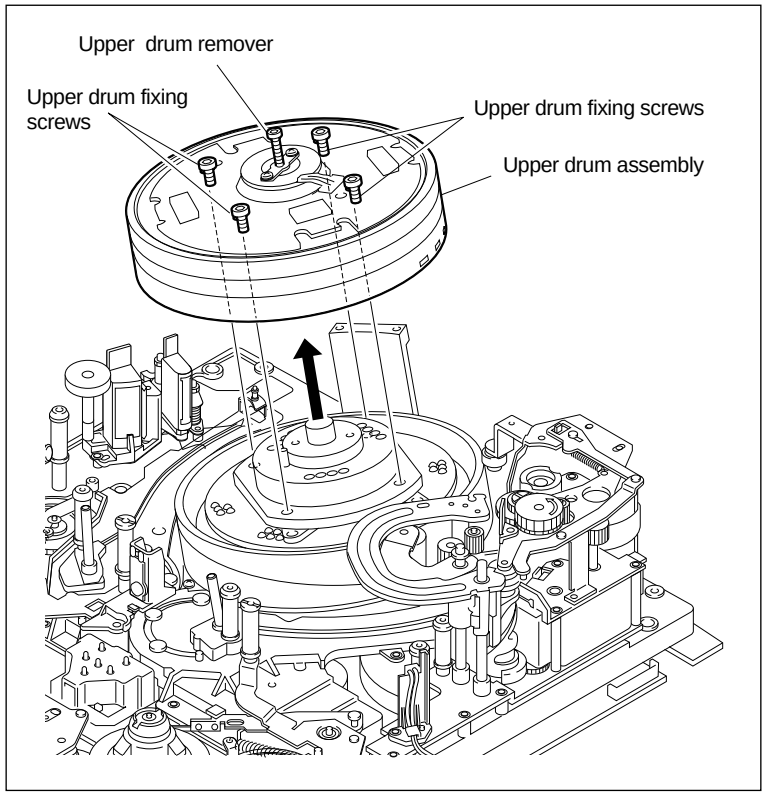
Note

Loosen the four upper drum fixing screws fully. Do not turn the screw of the upper drum remover without loosening these screws fully. If not, this may damage the lower drum.

(4) Tighten the screw in the center of the upper drum remover using an L-shaped wrench and remove the upper drum assembly in the direction indicated by the arrow.

Note

Be careful not to damage the upper edge of the lower drum after the upper drum assembly is removed.



Installation

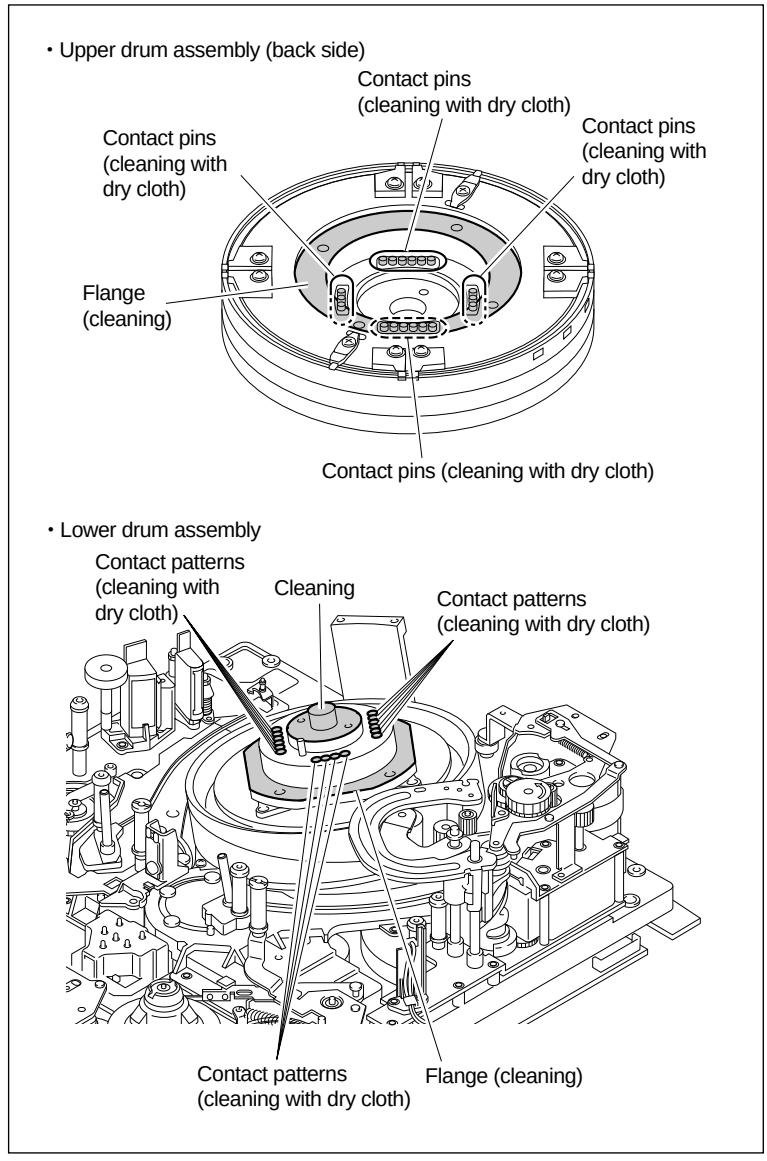
5. Installation surfaces cleaning

(1) Clean the portions below with cleaning cloth moistened with cleaning fluid.
- Flange surfaces of lower drum (portions shown in the figure)
- Tape running surface and lead of the lower drum
- Installation surface of a new upper drum assembly (portion shown in the figure)

(2) Wipe the 20 contact pins of the upper drum and the 20 contact patterns of the lower drum.

Note

Do not apply cleaning fluid to the contact pins and contact patterns.

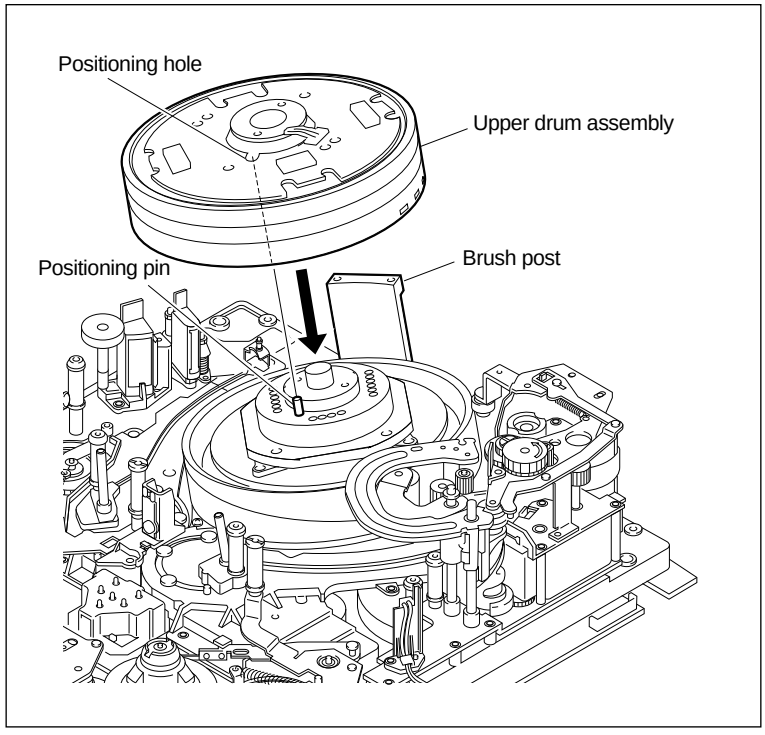

• Upper drum assembly (back side)
Contact pins (cleaning with dry cloth)
Contact pins (cleaning with dry cloth)
Contact pins (cleaning with dry cloth)
Flange (cleaning)
Contact pins (cleaning with dry cloth)
• Lower drum assembly
Contact patterns (cleaning with dry cloth)
Cleaning
Contact patterns (cleaning with dry cloth)
Contact patterns (cleaning with dry cloth)
Flange (cleaning)

6. Upper drum assembly installation

(1) Align the positioning hole of the upper drum assembly shown in the figure with the positioning pin of the lower drum, and put the upper drum assembly on the lower drum. At that time, confirm that the positioning pin protrudes from the upper surface of the upper drum.

Note

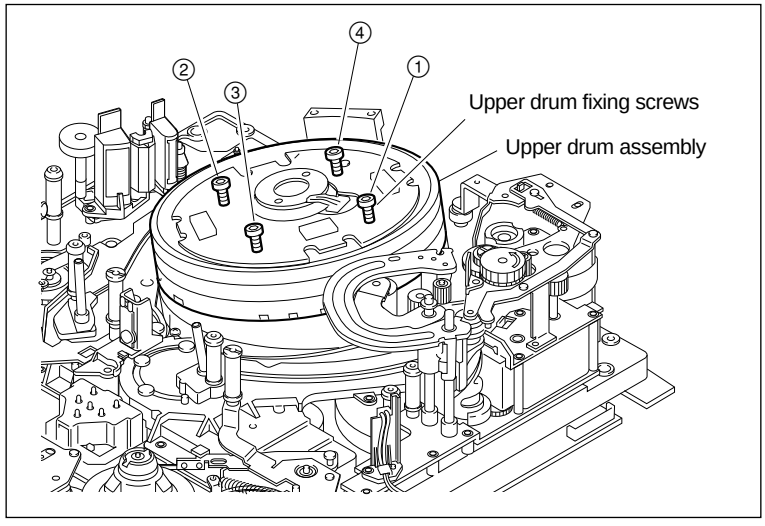
Hold the upper drum assembly in the portion where the video heads does not exist. Take care that the video heads does not contact with the brush post and its peripheral parts when the upper drum assembly is installed. Put the upper drum assembly on the lower drum, and never push the outer circumferential part of the drum by hands.



(2) Push the center part of the upper drum with fingers just downward and bring the upper drum in contact with the flange of the lower drum.

(3) In the state in step (2), fix the four screws tentatively in the order shown in the figure at the torque below.
[Tightening torque: 10×10^{-2} N•m
{1.0 kgf•cm}]

(4) Tighten the four screws at the torque below.
[Tightening torque: 25×10^{-2} N•m
{2.5 kgf•cm}]



7. Slip ring assembly installation

Install the slip ring assembly.
(Refer to Section 3-4.)

8. Brush assembly installation

Install the brush assembly. (Refer to Section 3-3.)

9. Brush cover installation

Install the brush cover. (Refer to Section 3-3.)

10. Video head and tape running surfaces cleaning

Clean the portions below with cleaning cloth moistened with cleaning fluid.

- Tape running surface of the upper drum and video heads. (Refer to the maintenance manual Part 1, Section 4-2-3.)
- Lead and tape running surface of lower drum. (Refer to the maintenance manual Part 1, Section 4-2-4.)

Note

After cleaning, wipe with dry cloth.

Adjustment after replacement

11. Video tracking adjustment

(Refer to Section 5-5.)

12. CTL head position adjustment

(Refer to Section 5-7.)

13. AT head position adjustment

(Refer to Section 5-8.)

14. Drum phase adjustment

(Refer to Section 6-2.)

15. PB system adjustment

(Refer to Section 6-2.)

16. REC system adjustment

(Refer to Section 6-2.)

3-3. Brush Replacement

Outline

Replacement

Brush cover removal
Brush assembly removal
Brush assembly installation
Brush cover installation

Precaution

Replace the brush assembly when the brush is worn. The relative height and contact pressure to the slip ring are automatically adjusted when the brush assembly is installed according to the procedures below.
The adjustment after replacement is not required in this case. Never clean the brush surface with cleaning cloth moistened with cleaning fluid.

Preparations

1. Turn off the power.
2. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Reference

The brush assembly can be replaced with the cassette compartment installed.

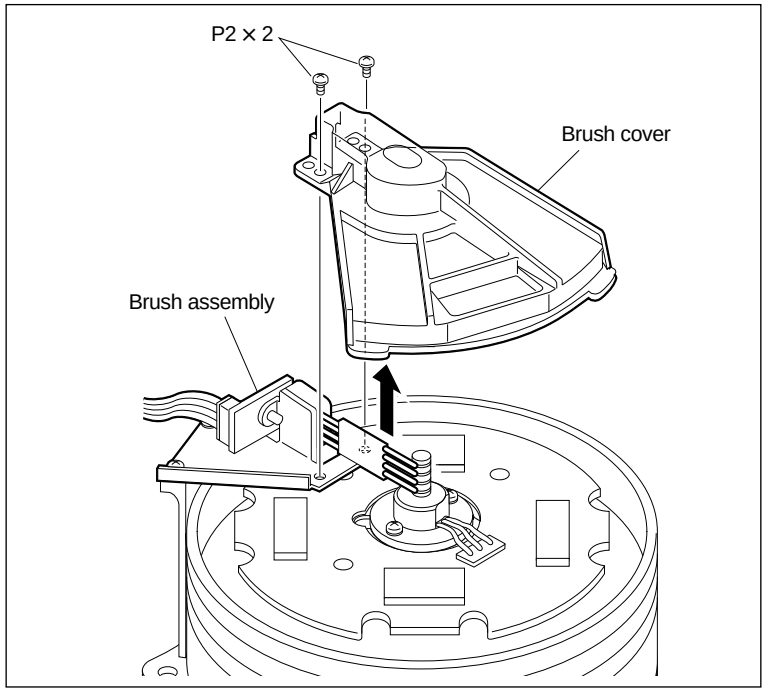
Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A

Removal

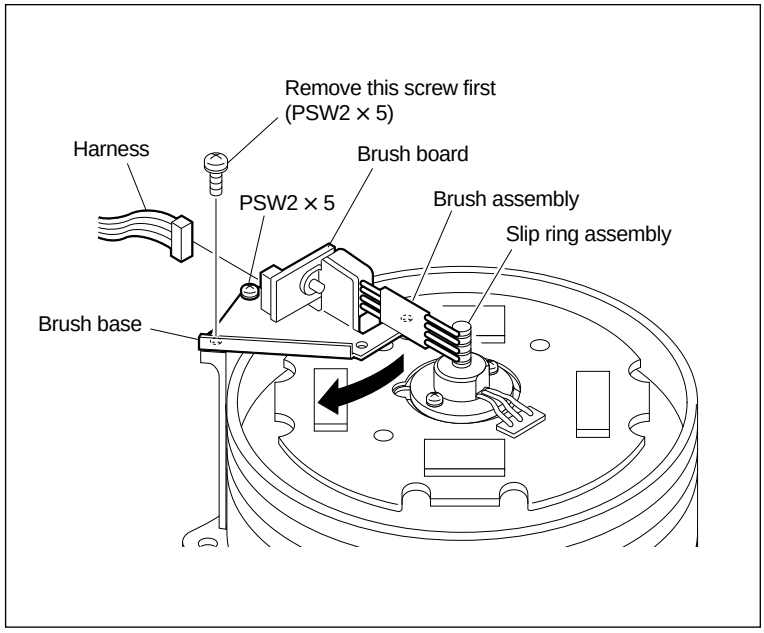
1. Brush cover removal

Remove the two screws, then remove the brush cover.



2. Brush assembly removal

(1) Disconnect the harness connected to the brush board.
(2) Remove the screw shown in the figure of the two screws fixing the brush base.
(3) Loosen the other screw and move the brush base in the direction indicated by the arrow. The engagement of the brush and slip ring is then released.
(4) Remove the screw, then remove the brush assembly.



Installation

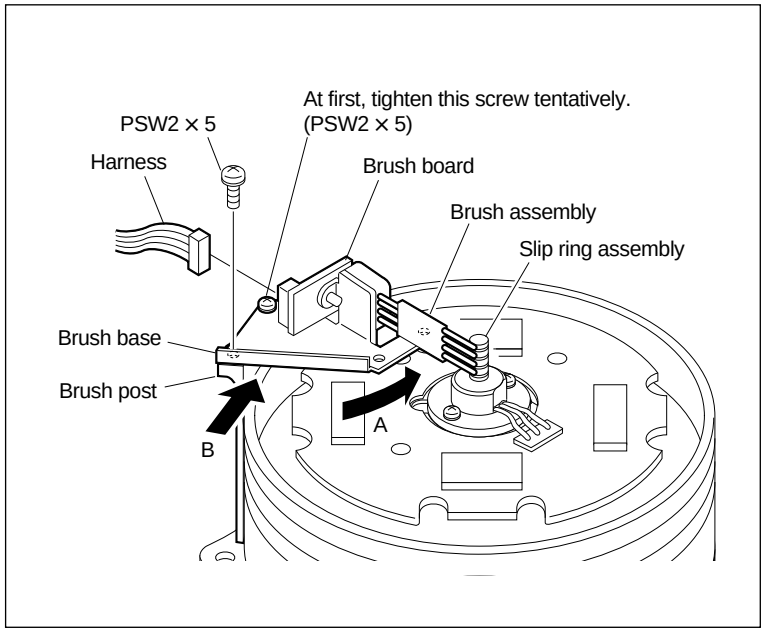
3. Brush assembly installation

(1) Fix the brush base tentatively to the brush post with the screw shown in the figure.

Note

Never touch the brush.

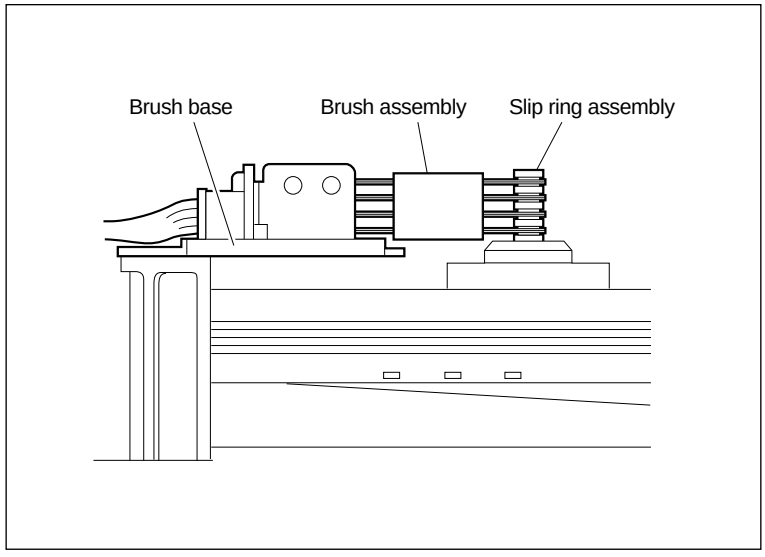
(2) Move the brush base in the direction indicated by arrow A while pushing it downward at the top of the brush post, and fix the other screw tentatively.
(3) Tighten the screws fixed tentatively in steps (1) and (2) while pushing the brush base in the direction indicated by arrow B.
[Tightening torque: 20×10^{-2} N•m
{2.0 kgf•cm}]
(4) Connect the harness disconnected in step (1) of procedure 2 to the connector on the brush board.



(5) Check that the brush surely touches the grooves of the slip ring.

Reference

The brush height and the contact pressure to the slip ring are automatically adjusted by executing steps (1) to (3).



4. Brush cover installation

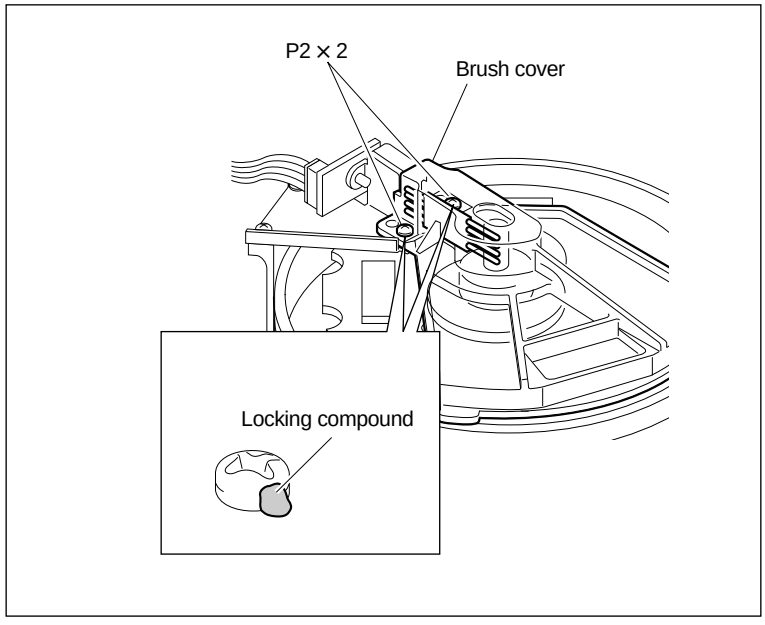
(1) Adjust the position so that the shaft of the slip ring is almost located in the center of the hole at the tip of the brush cover and fix the cover with two screws.
[Tightening torque: 10×10^{-2} N•m
{1.0 kgf•cm}]

Note

Be careful not to apply excessive force to the brush base.

(2) Apply the screw locking compound to two screws.

(3) Recheck that the brush surely touches the grooves of the slip ring.



3-4. Slip Ring Assembly Replacement

Outline

Replacement

Brush cover removal
Brush assembly removal
Slip ring assembly removal
Slip ring assembly installation
Brush assembly installation
Brush cover installation

Precaution

Replace the slip ring assembly when the slip ring is worn. The adjustment after the slip ring assembly replacement is not required. Never clean the slip ring surface with cleaning fluid.

Preparations

1. Turn off the power.
2. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Reference

The brush assembly can be replaced with the cassette compartment installed.

Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A

Removal

1. Brush cover removal

Remove the brush cover. (Refer to Section 3-3.)

2. Brush assembly removal

Remove the brush assembly.
(Refer to Section 3-3.)

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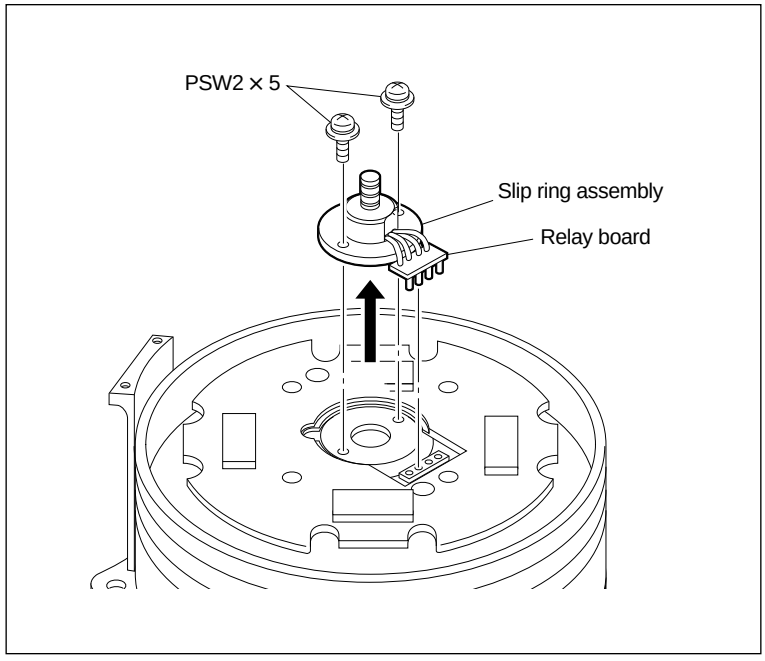
3. Slip ring assembly removal

(1) Remove the two screws, then remove the slip ring assembly.
(2) Pull out the small relay board just above to which the lead wires are soldered.



Installation

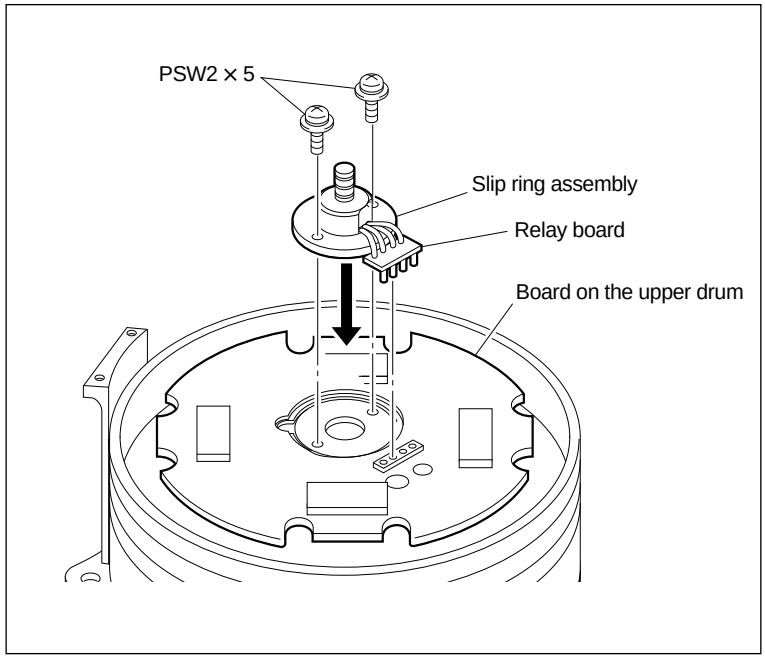
4. Slip ring assembly installation

(1) Install a new slip ring assembly in the drum shaft in the direction indicated by the arrow.

Note

Never touch the slip ring during installation.

(2) Install the slip ring assembly with two screws. [Tightening torque: 20×10^{-2} N•m {2.0 kgf.cm}]
(3) Connect the small relay board of the slip ring assembly to the board on the upper drum assembly.



5. Brush assembly installation

Install the brush assembly. (Refer to Section 3-3.)

6. Brush cover installation

Install the brush cover. (Refer to Section 3-3.)

3-5. Drum Assembly Replacement

Outline

Replacement

Drum assembly removal
Installation surfaces cleaning
Drum assembly installation
Video heads and tape running surfaces cleaning

Adjustment after replacement

Tape running adjustment
Video tracking adjustment
CTL head position adjustment
AT head position adjustment
Drum phase system adjustment
PB system adjustment
REC system adjustment

Precaution

Be careful not to damage the CTL head, AT head, and peripheral tape guides when replacing the drum assembly.
Take care that the video heads of the drum assembly is not damaged during replacement.

Basic knowledge

For except the periodic replacement, replace the drum assembly in the following cases.

- When the damaged upper drum assembly or tape running surface cannot be recovered
- When no proper RF waveform can be obtained during tracking adjustment because of the worn upper drum assembly or lower drum
- When the VTR performance cannot be satisfied due to noises or jitters because of its bearing life

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

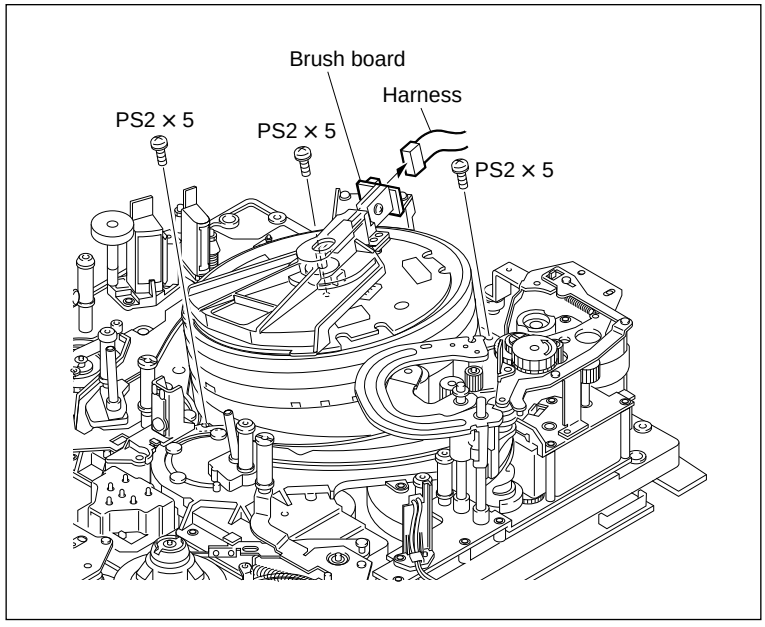
Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

1. Drum assembly removal

(1) Remove the three screws fixing the drum assembly.

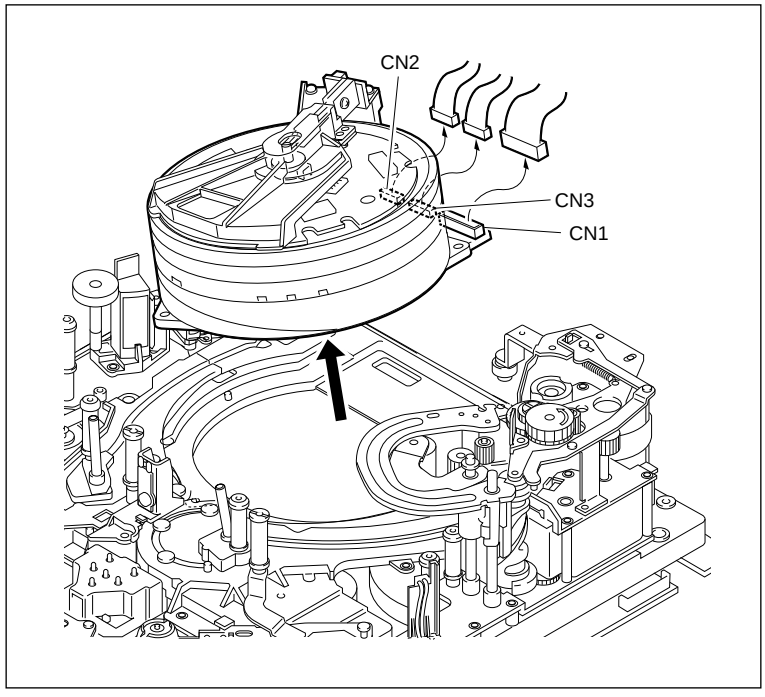
(2) Disconnect the connector connected to the brush board.



(3) Raise the drum assembly just above and disconnect the three connectors (CN1, CN2 and CN3) connected to the board below the drum. The drum assembly can be then removed.

Note

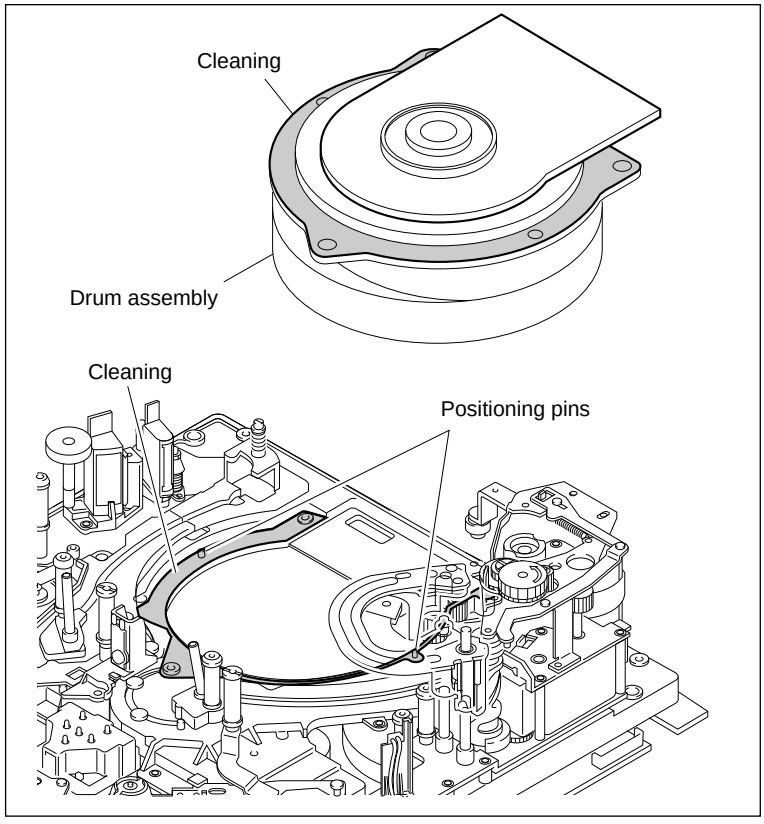
Be careful not to damage the CTL head, AT head, and peripheral tape guides when removing the drum assembly.



Installation

2. Installation surfaces cleaning

Clean the installation surfaces of a new drum assembly and chassis with cleaning cloth moistened with cleaning fluid.



3. Drum assembly installation

(1) Hold the new drum assembly and connect the three connectors (CN1, CN2 and CN3) disconnected in step (3) of procedure 1.

Notes

- Be sure to hold the drum assembly portion in which no video heads exist when holding the new drum assembly.
- Take care that the drum assembly does not contact the CTL head, AT head, and peripheral tape guides.
- Do not apply excessive force to the brush.

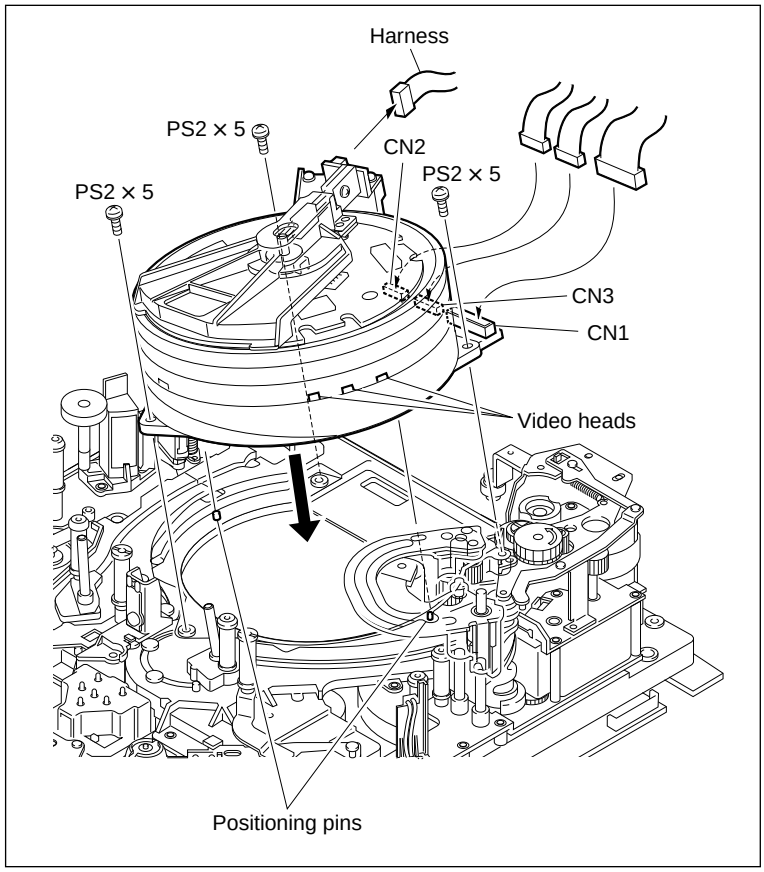
(2) Connect the harness connector to the brush board.

(3) Align the two positioning pins of the chassis with the holes of the drum assembly, then install.

(4) Confirm that the drum assembly is firmly inserted into the positioning pins by moving it slightly.

(5) Tighten the three screws.
[Tightening torque: 20×10^{-2} N•m
{2.0 kgf•cm}]

(6) Confirm that the brush surely touches the grooves of the slip ring.



4. Video heads and tape running surfaces cleaning

Clean the portions below with cleaning cloth moistened with cleaning fluid.

- Tape running surfaces of the upper drum and video heads (Refer to the maintenance manual Part 1, Section 4-2-3.)
- Lead and tape running surfaces of lower drum (Refer to the maintenance manual Part 1, Section 4-2-4.)

Note

After cleaning, wipe with dry cloth.

Adjustment after replacement

5. Tape running adjustment

(Refer to Section 5-4.)

6. Video tracking adjustment

(Refer to Section 5-5.)

7. CTL head position adjustment

(Refer to Section 5-7.)

8. AT head position adjustment

(Refer to Section 5-8.)

9. Drum phase system adjustment

(Refer to Section 6-2.)

10. PB system adjustment

(Refer to Section 6-2.)

11. REC system adjustment

(Refer to Section 6-2.)

3-6. Video Head Cleaner Replacement

Outline

Replacement

VH cleaner assembly removal
Cleaning roller replacement
VH cleaner assembly installation
Operation check

Precautions

- The video head cleaner can be replaced with the cassette compartment attached.
- The following new CR cap is required when replacing the video head cleaner.
  CR cap: 3-615-320-01

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

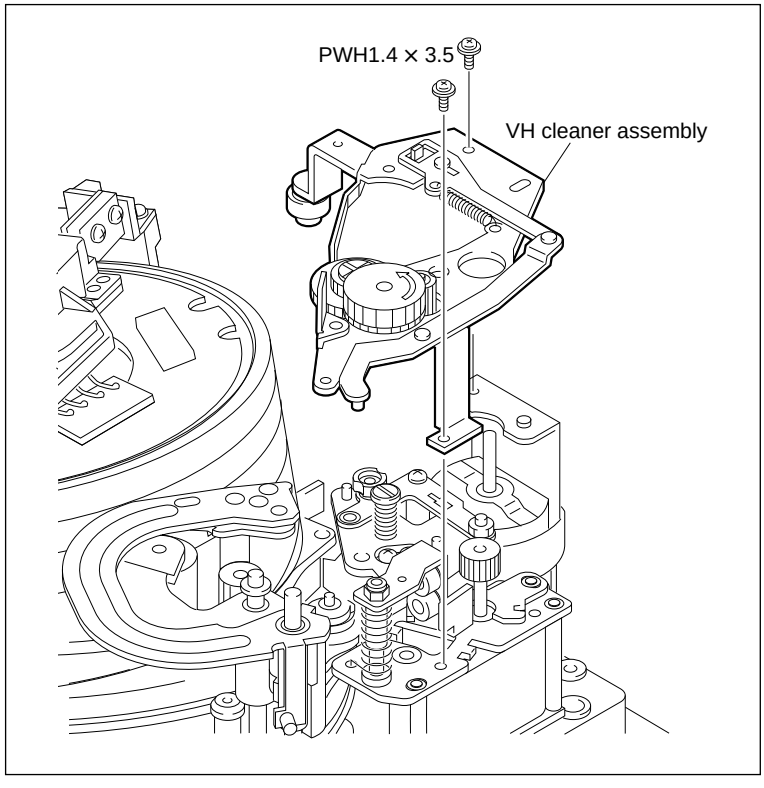
Tools

- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver (for 3 kg): J-6325-400-A

Replacement

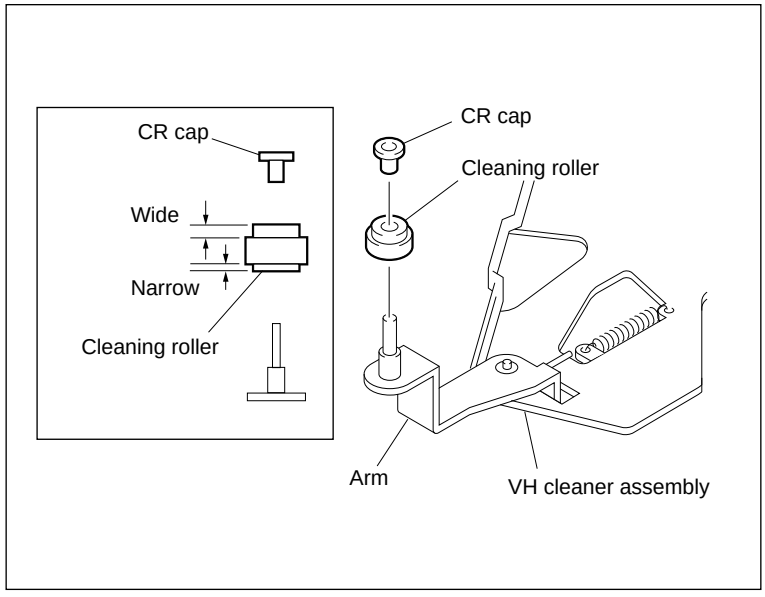
1. VH cleaner assembly removal

Remove the two screws, then remove the VH cleaner assembly.



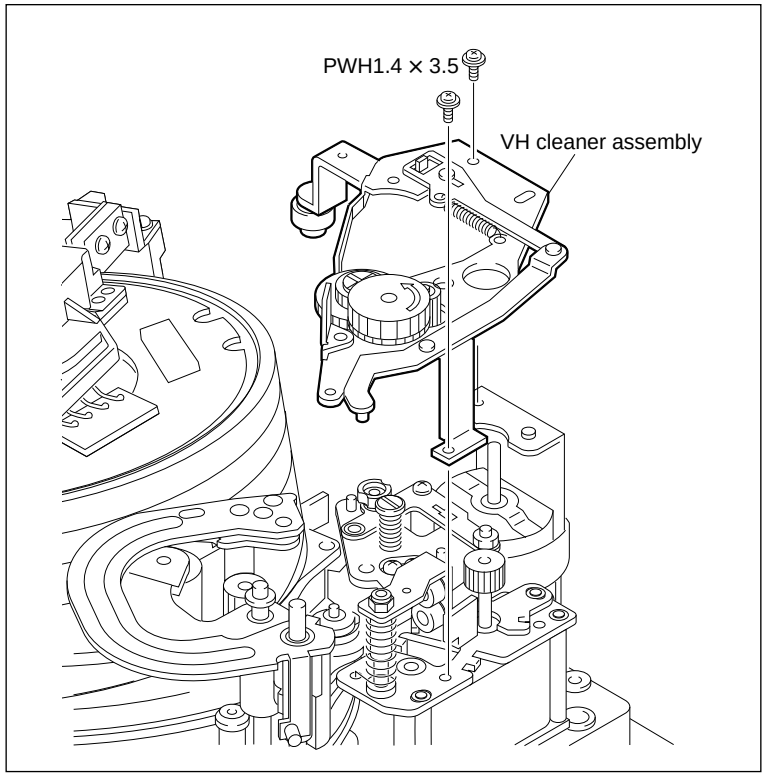
2. Cleaning roller replacement

(1) Remove the CR cap, and then lift the cleaning roller out.
(2) Put a new cleaning roller into the shaft in the direction indicated by the figure.
(3) Push a new CR cap into the shaft and push the spacer as far as it will go while supporting the arm by finger.



3. VH cleaner assembly installation

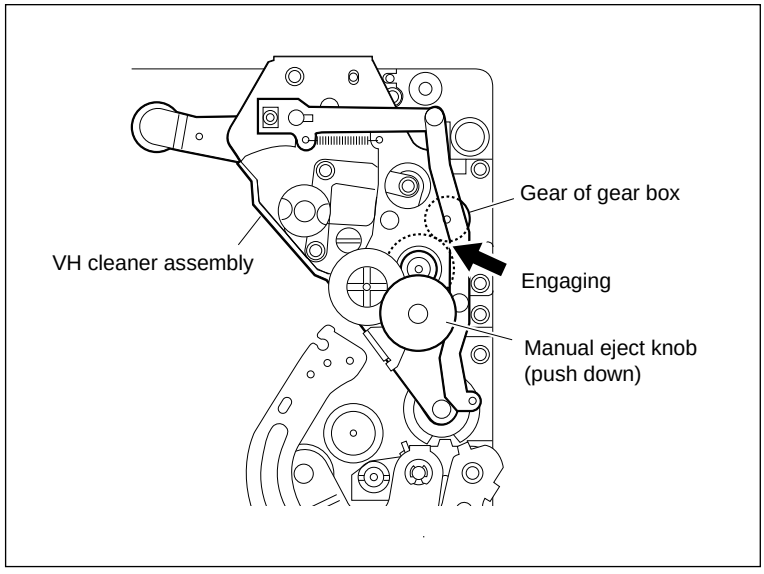
(1) Install the VH cleaner assembly with the two screws.
[Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}]



(2) Confirm that the gear of the VH cleaner assembly is engaged with the gear of the gear box when the manual eject knob is pushed down.

4. Operation check

Check that the cleaning roller touches to the drum, or releases from the drum the drum when the manual eject knob is turned clockwise and counterclockwise.



3-7. Pinch Roller Replacement

Outline

Replacement

Pinch arm assembly removal
Pinch roller replacement
Pinch arm assembly installation
Cleaning
Operation check

Adjustment after replacement

Tape running adjustment

Precautions

- The pinch roller can be replaced with the cassette compartment installed.
- The following new E ring is required when replacing the pinch roller.
  E ring(2.3): 7-624-105-04

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

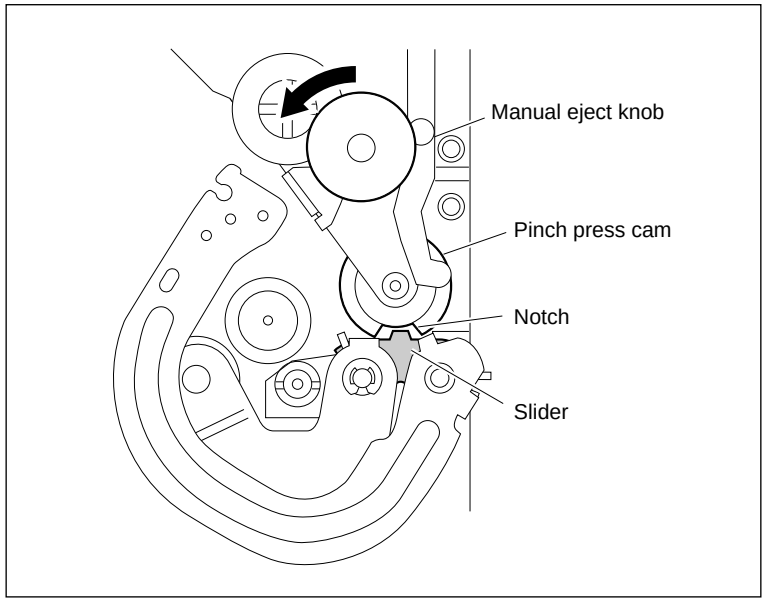
Tools

- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Oil: 7-611-018-18

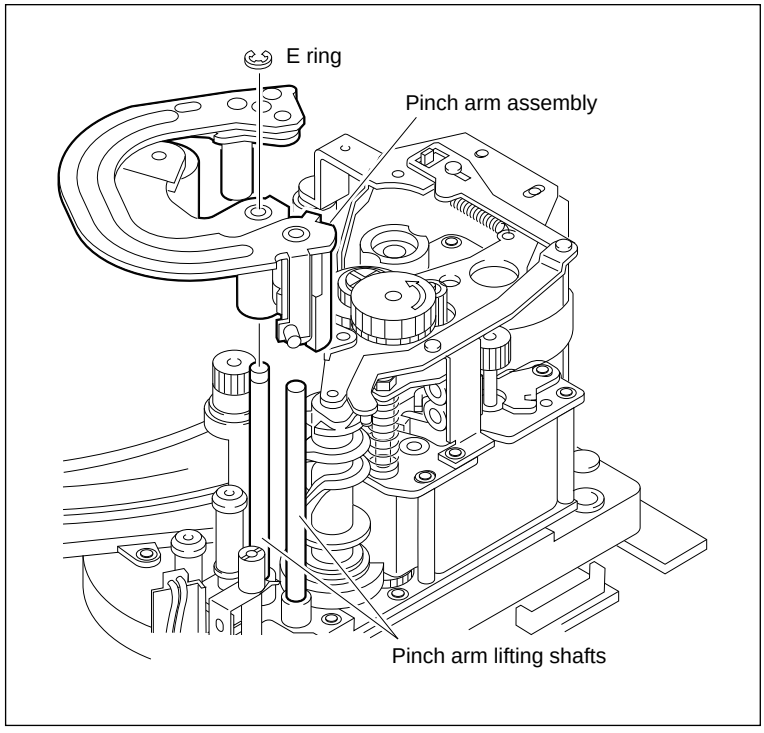
Replacement

1. Pinch arm assembly removal

(1) Turn the manual eject knob counterclockwise so that the notch of the pinch press cam fits with the slider of the pinch arm assembly.

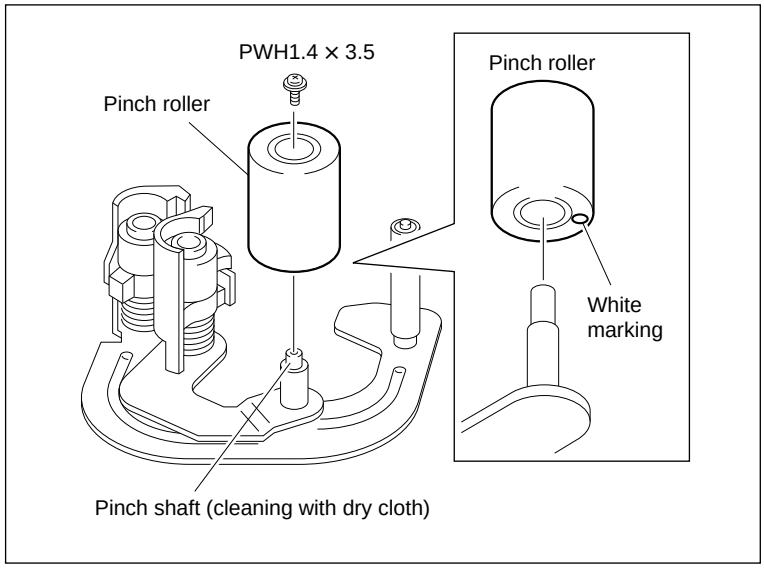


(2) Remove the E ring of the pinch arm lifting shaft with tweezers.
(3) Pull out the pinch arm assembly just above from the pinch arm lifting shafts.



2. Pinch roller replacement

(1) Remove one screw, then remove the pinch roller.
(2) Wipe the pinch shaft with soft cloth.
(3) Insert a new pinch roller into the pinch shaft in the direction indicated by the figure and tighten it with one screw.
[Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}]



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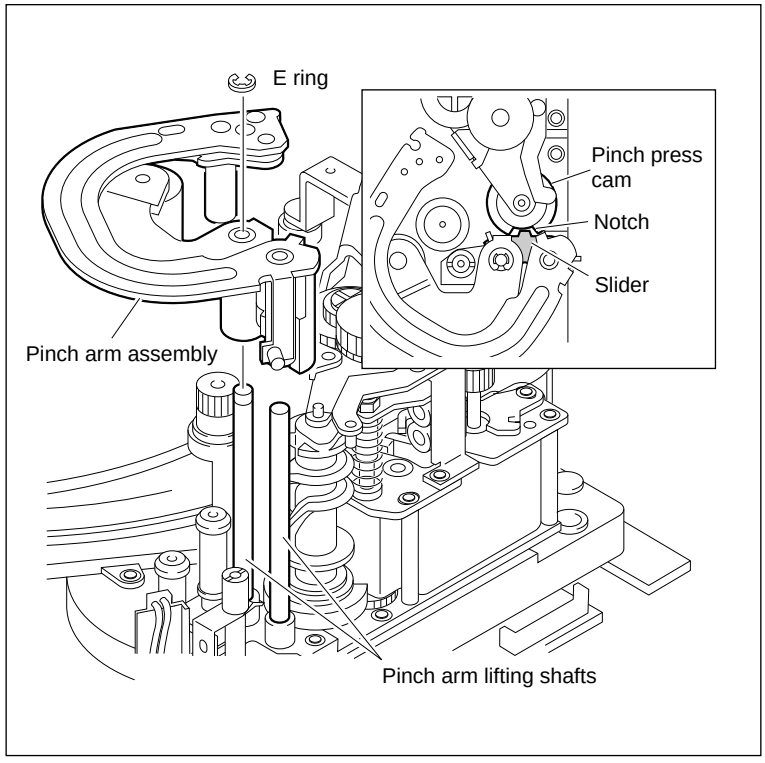
3. Pinch arm assembly installation

(1) Clean the pinch arm lifting shafts with cleaning cloth moistened with cleaning fluid.
(2) Apply a quarter drop of oil to the pinch arm lifting shafts.
(3) Put the holes of the pinch arm assembly into the pinch arm lifting shafts while putting the slider of the pinch arm assembly into the notch of the pinch press cam.
(4) Install a new E ring to the pinch arm lifting shaft.



4. Cleaning

Clean the surface of the pinch roller and T3 tape guide with cleaning cloth moistened with cleaning fluid. (Refer to the maintenance manual Part 1, Section 4-2-6.)

5. Operation check

Check that the pinch roller is engaged to the capstan shaft when the unit is in the threading end state.

Adjustment after replacement

6. Tape running adjustment

(Refer to Section 5-4.)

3-8. Swing Gear Replacement

Outline

Replacement

Timing belt removal
Swing gear replacement
Timing belt installation

Adjustment after replacement

Tape running adjustment

Precautions

- The mechanical deck assembly should be removed from the unit when the swing gear is replaced. Be careful not to damage the video heads, drum, and other parts during removal.
- The following new stop washer is required when replacing the swing gear.
  Stop washer: 3-315-384-11

Preparations

1. Turn off the power.
2. Remove the mechanical deck assembly. (Refer to Section 3-1-8.)

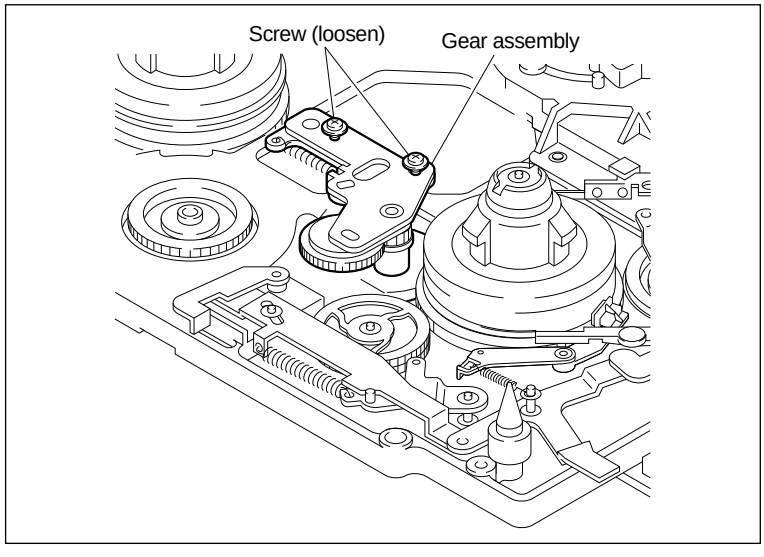
Tools

- Hexagon bit (Across flat has 1.5 mm): J-6326-120-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Stop washer fastening tool: J-6323-530-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Removal

1. Timing belt removal

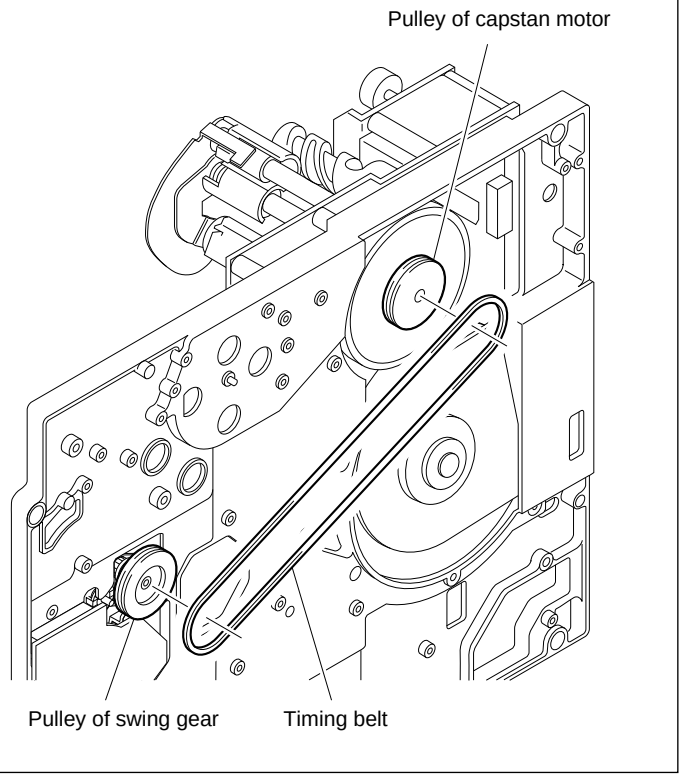
(1) Loosen the two screws shown in the figure of the gear assembly by one half to one turn.



(2) Remove the timing belt from the pulley on the back of the mechanical deck.

Note

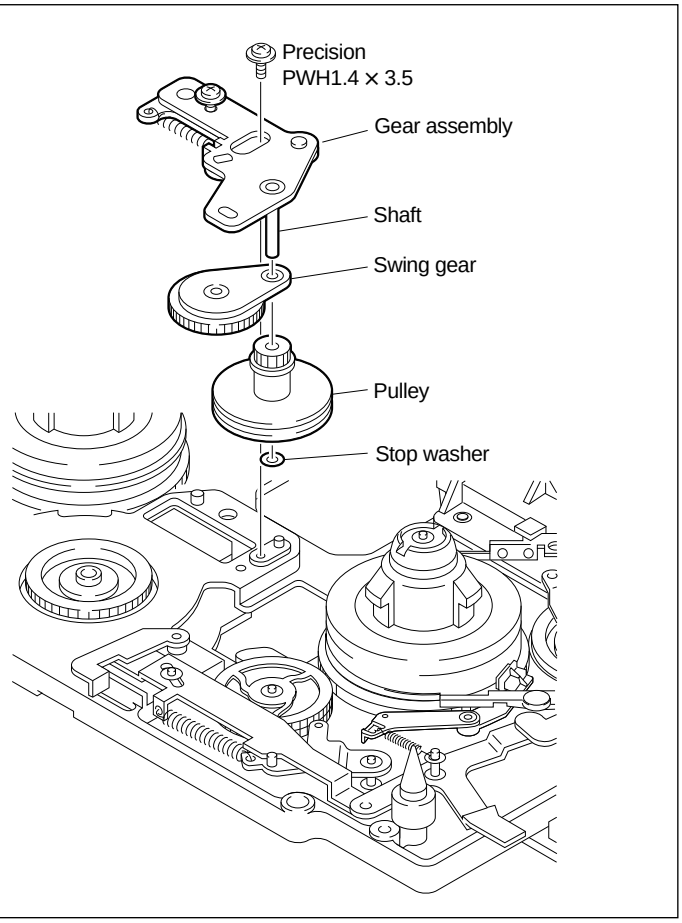
Be careful not to stretch or bend the removed timing belt.



Installation

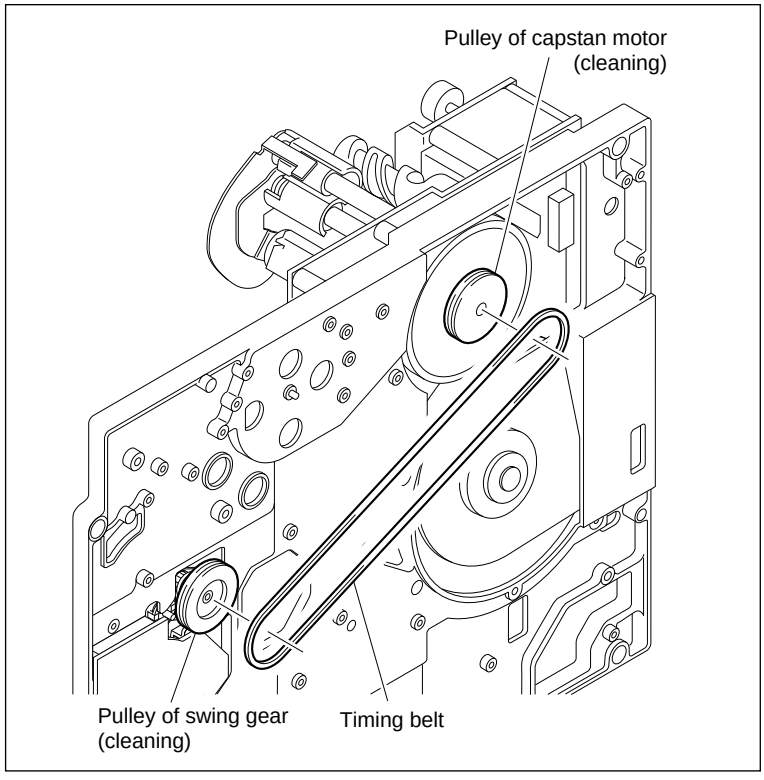
2. Swing gear replacement

(1) Remove the one percision screw, then remove the gear assembly from the mechanical deck.
(2) Remove the stop washer and pull out the swing gear and pulley.
(3) Clean the shaft of the gear assembly with a soft cloth.
(4) Apply one half of oil to the shaft of the gear assembly.
(5) Pass a new swing gear through the shaft of the gear assembly.
(6) Pass the pulley removed in step (2) through the shaft of the gear assembly and fasten them using a new stop washer.
(7) Install the gear assembly in the mechanical deck with the one percision screw.
[Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}]



3. Timing belt installation

(1) Clean the pulleys of the swing gear and capstan motor with cleaning cloth moistened with cleaning fluid.
(2) Loop the timing belt removed in procedure 1 over the pulley of the swing gear .
(3) Loop the other end of the timing belt over the pulley of the capstan motor.

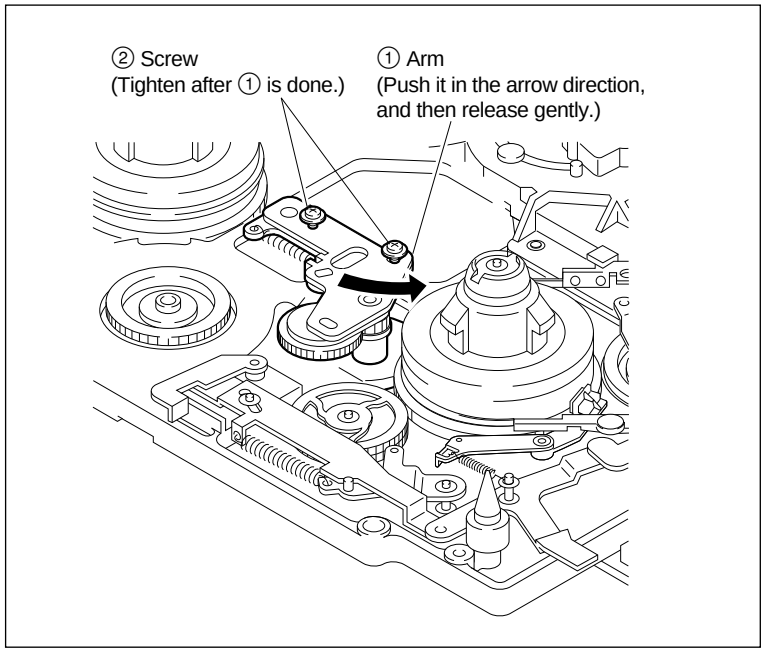


(4) Push the arm of the gear assembly in the direction indicated by the arrow with fingers and release it gently. The arm of the gear assembly slightly returns in the clockwise direction by spring force.
(5) Tighten the two screws loosened in step (1) of procedure 1. At that time, do not hold the arm of the gear assembly with fingers.
[Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}]

Note

The tension of the timing belt is adjusted by performing steps (4) and (5).

(6) Apply locking fluid to the screws after tightened in step (5). When applying, avoid the slot of the screw.



Adjustment after replacement

4. Tape running adjustment

(Refer to Section 5-4.)

3-9. Tension Regulator Band Replacement

Outline

Replacement

T tension regulator arm assembly removal
Tension regulator band removal
Tension regulator band installation
T tension regulator arm assembly installation

Adjustment after replacement

Tape running adjustment
REV back tension adjustment

Precaution

The following new stop washer is required when replacing the tension regulator band.
Stop washer: 3-559-408-11

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

Tools

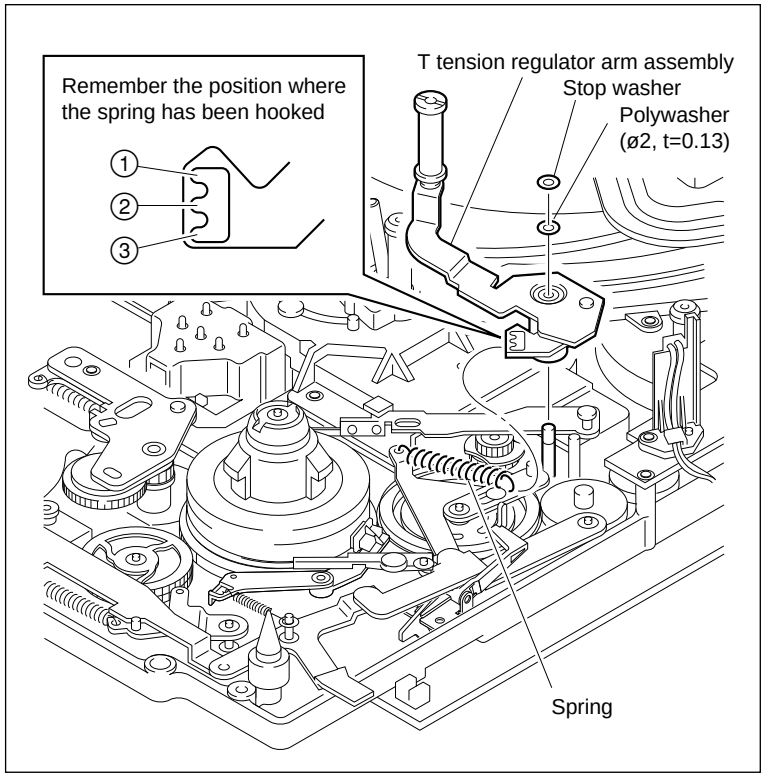
- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Stop washer fastening tool: J-6323-530-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Removal

1. T tension regulator arm assembly removal

(1) Unhook the spring of the T tension regulator arm shown in the figure. At that time, be sure to remember the position where the spring has been hooked.

(2) Remove the stop washer and polywasher, then remove the T tension regulator arm assembly.

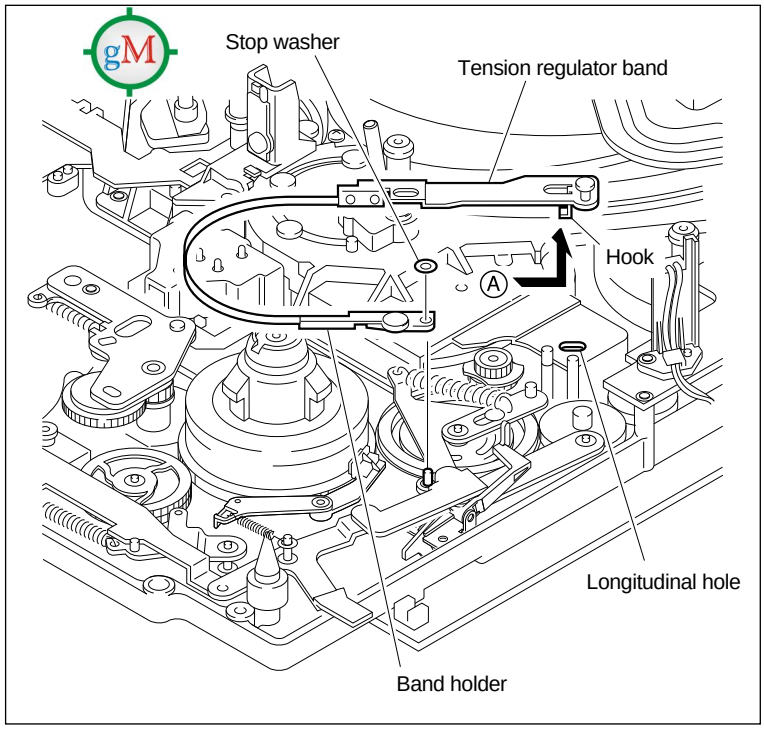


2. Tension regulator band removal

(1) Remove the stop washer shown in the figure.

(2) Remove the band holder from the shaft of the band adjustment bracket.

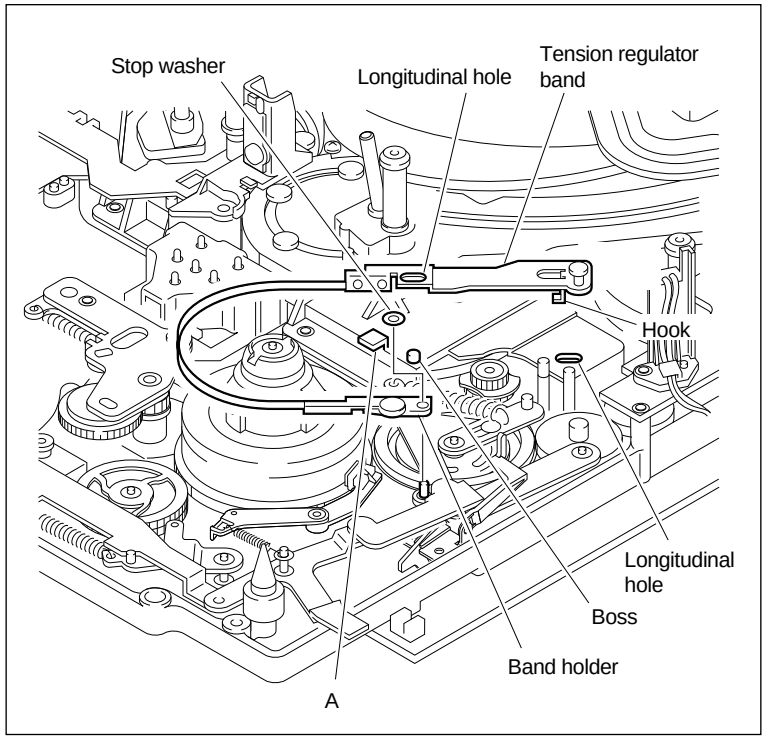
(3) Move the tension regulator band in the direction indicated by arrow A, remove the hook from the longitudinal hole of the T rail, then remove the tension regulator band.



Installation

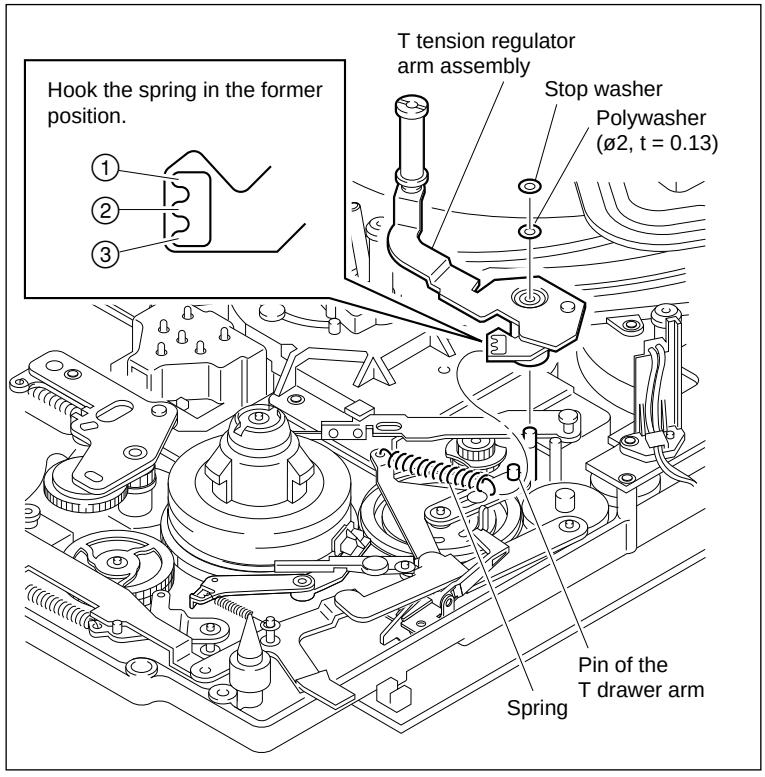
3. Tension regulator band installation

(1) Put the hook of a new tension regulator band into the longitudinal hole on the T rail.
(2) Put the longitudinal hole of the tension regulator band to the boss on the T rail. At that time, confirm that the tension regulator band is passed under the portion A of the T rail.
(3) Put the hole of the band holder into the shaft of the band adjustment bracket and fasten it using a new stop washer.



4. T tension regulator arm assembly installation

(1) Insert a new T tension regulator arm assembly into the shaft so that the pin of the T drawer arm is put between the spring hook plate and regulator arm assembly, and then install the polywasher and a new stop washer.
(2) Hook the spring removed in step (1) of procedure 1 in the former position.



Adjustment after replacement

5. Tape running adjustment

(Refer to Section 5-4.)

6. REV back tension adjustment

(Refer to Section 5-3-2.)

3-10. CTL Head Replacement

Outline

Replacement

CTL/FE head assembly removal
CTL head replacement
CTL/FE head assembly installation
CTL/FE head assembly cleaning

Adjustment after replacement

Tape running check
Video tracking adjustment
CTL head height adjustment
CTL head position adjustment
AT head position adjustment

CAUTION

Never contact the tape cleaner on the CTL/FE head block with bare hands. The tape cleaner has a sharp edge. Pay careful attention when replacing or adjusting the CTL head.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Tools

- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Removal

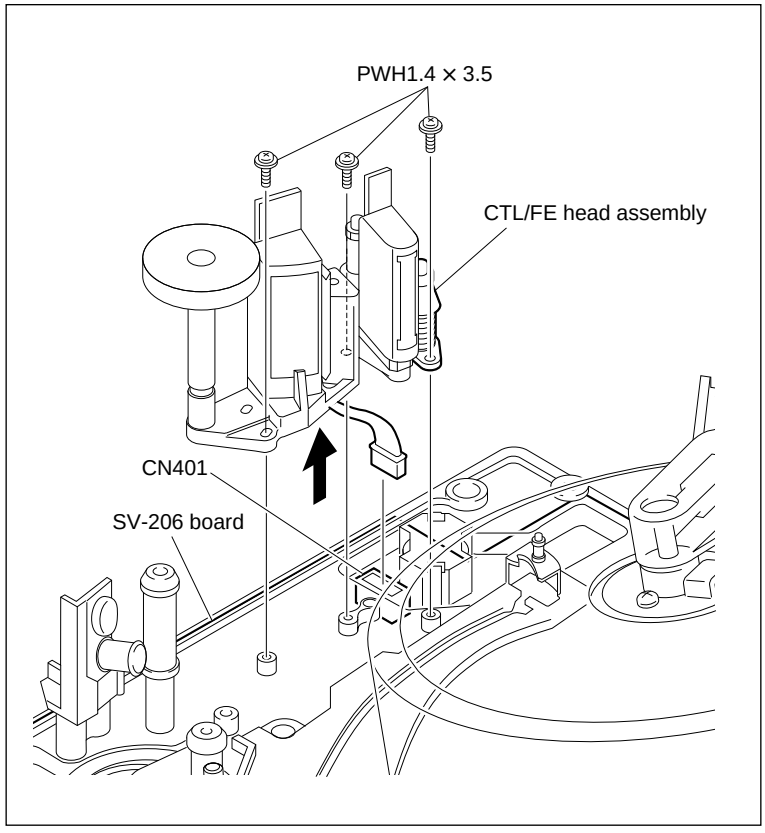
1. CTL/FE head assembly removal

(1) Disconnect connector CN401 on the SV-206 board.

(2) Remove the three screws, then remove the CTL/FE head assembly from the mechanical deck.

Note

Be careful not to damage the video heads, drum, full erase head, tape guide, and other parts using a screwdriver.



2. CTL head replacement

(1) Unsolder the two wires connected to the head.

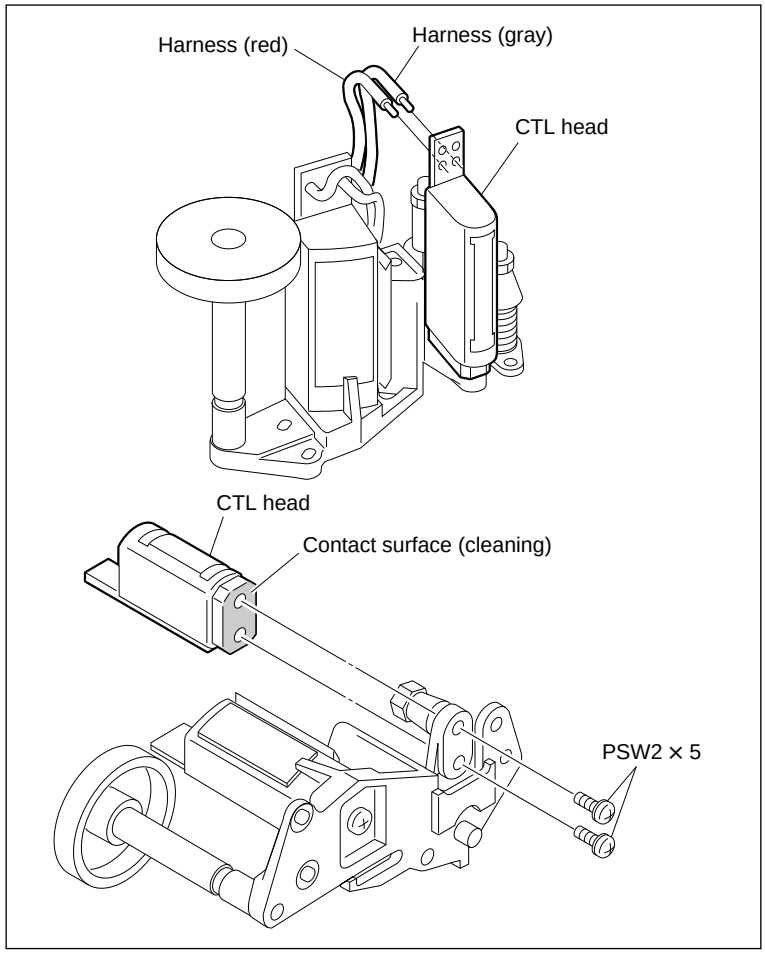
(2) Remove the two screws at the back of the CTL head, then remove the CTL head.

(3) Clean the contact surface and install a new CTL head with two screws.

(4) Solder the two wires to the printed circuit board of the CTL head.
(Refer to step (1) of procedure 2.)

Note

Never make a mistake in the color and place of the wire to be soldered. If so, a serious trouble occurs in the compatibility of the tape.

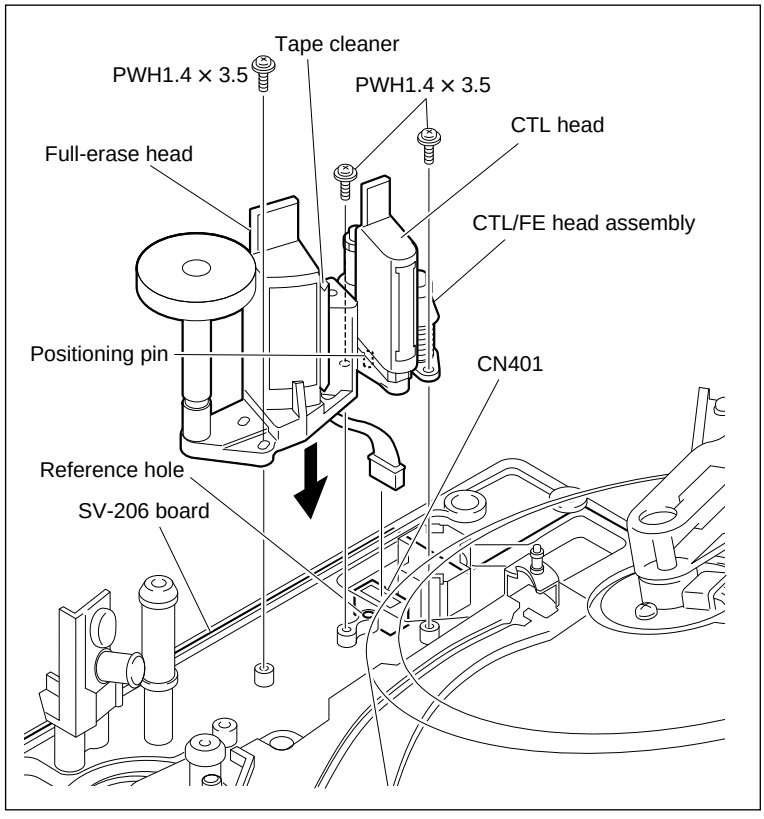


Installation

3. CTL/FE head assembly installation

(1) Put the positioning pin of the CTL/FE head assembly into the reference hole of the mechanical deck and install it with three screws.
[Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}]

(2) Connect the harness of the CTL/FE head assembly to connector CN401 on the SV-206 board.



4. CTL/FE head assembly cleaning

Clean the CTL head, full erase head and tape cleaner with cleaning cloth moistened with cleaning fluid.

Note

After cleaning, wipe with dry cloth.

Adjustment after replacement

5. Tape running check

(Refer to Section 5-4.)

6. Video tracking adjustment

(Refer to Section 5-5.)

7. CTL head height adjustment

(Refer to Section 5-6.)

8. CTL head position adjustment

(Refer to Section 5-7.)

9. AT head position adjustment

(Refer to Section 5-8.)

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3-11. Timing Belt Replacement

Outline

Replacement

Timing belt removal
Timing belt installation

Adjustment after replacement

Tape running adjustment

Precaution

Remove the mechanical deck assembly from the unit when the timing belt is replaced. Be careful not to damage the video heads, drum, and other parts during removal.

Preparations

1. Turn off the power.
2. Remove the mechanical deck assembly. (Refer to Section 3-1-8.)

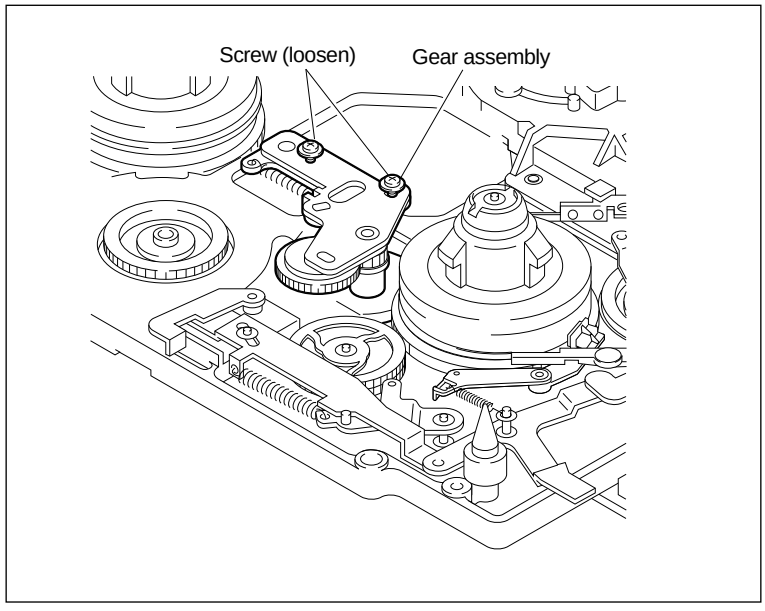
Tools

- Hexagon bit (Across flat has 1.5 mm): J-6326-120-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

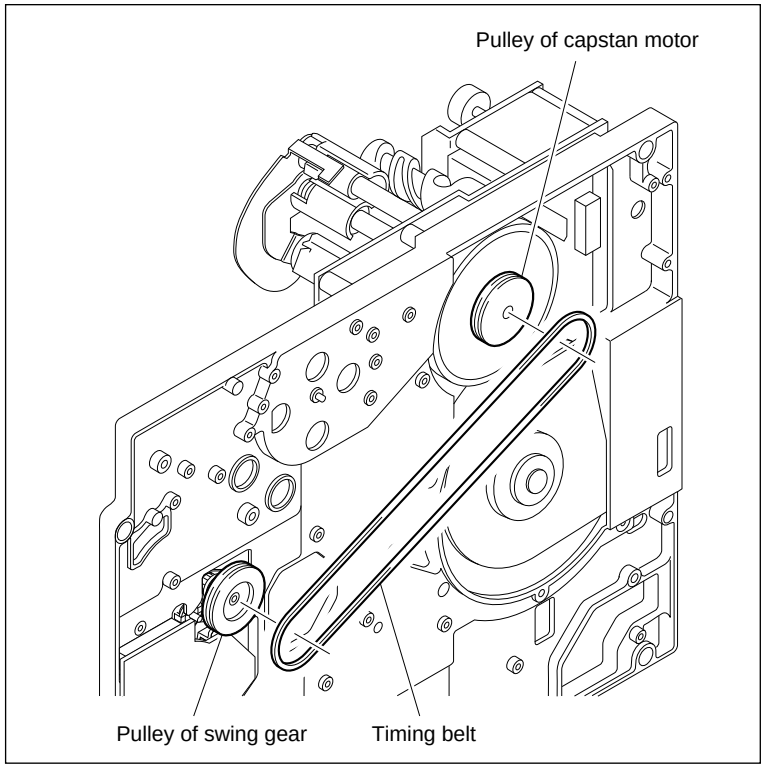
Removal

1. Timing belt removal

(1) Loosen the two screws shown in the figure of the gear assembly by one half to one turn.



(2) Remove the timing belt at the back of the mechanical deck from the pulley.



Installation

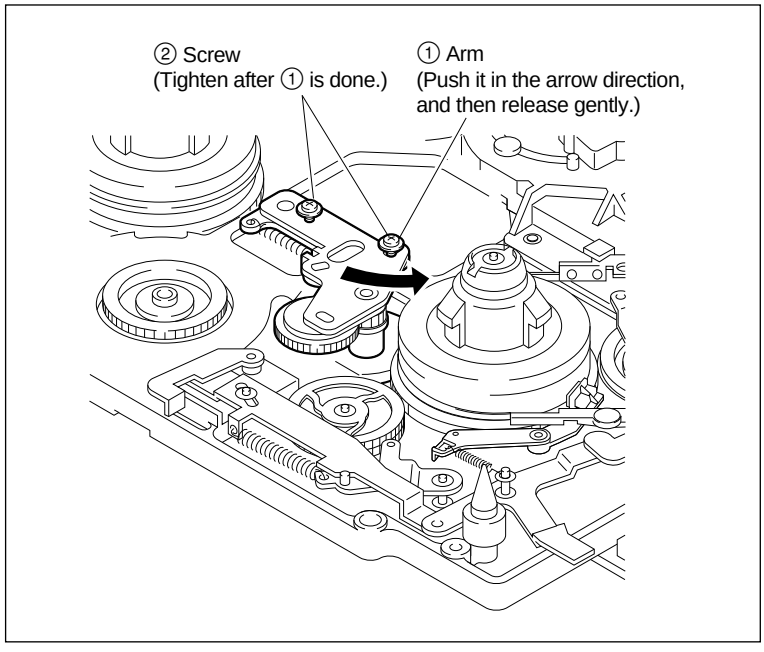
2. Timing belt installation

(1) Clean the pulleys of the swing gear and capstan motor with cleaning cloth moistened with cleaning fluid.
(2) Loop a new timing belt over the pulley of the swing gear.
(3) Loop the other end of the timing belt over the pulley of the capstan motor.

(4) Push the arm of the gear assembly in the direction indicated by the arrow with fingers and release it gently. The arm of the gear assembly slightly returns in the clockwise direction by spring force.
(5) Tighten the two screws loosened in step (1) of procedure 1. At that time, do not hold the arm of the gear assembly with fingers.
[Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}]

Reference

The tension of the timing belt is adjusted by performing steps (4) and (5).



(6) Apply locking fluid to the screws after tightened in step (5). When applying, avoid the slot of the screw.

Adjustment after replacement

3. Tape running adjustment

(Refer to Section 5-4.)

3-12. S Main Brake Shoe Replacement

Outline

Replacement

S brake assembly removal
Brake shoe replacement
S brake assembly installation
Operation check

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

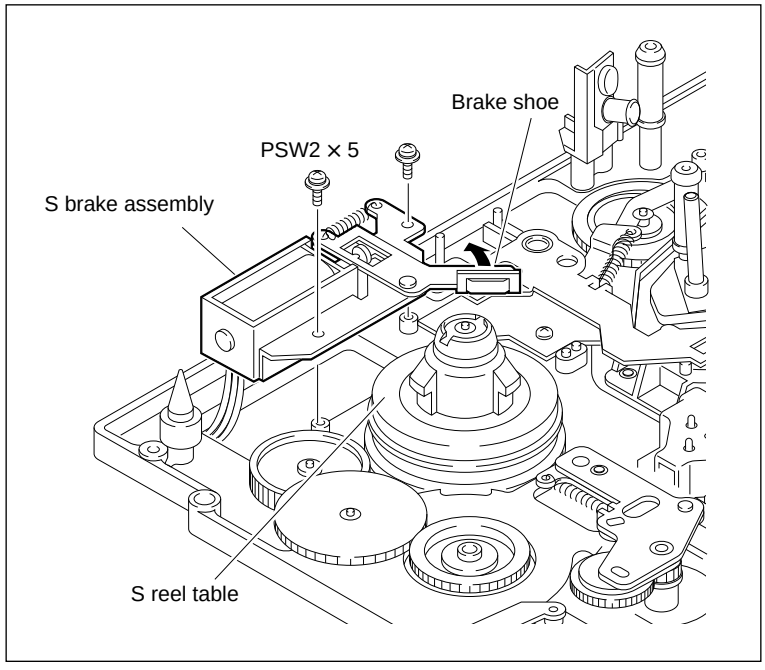
Tools

- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Cutter knife
- Tweezers

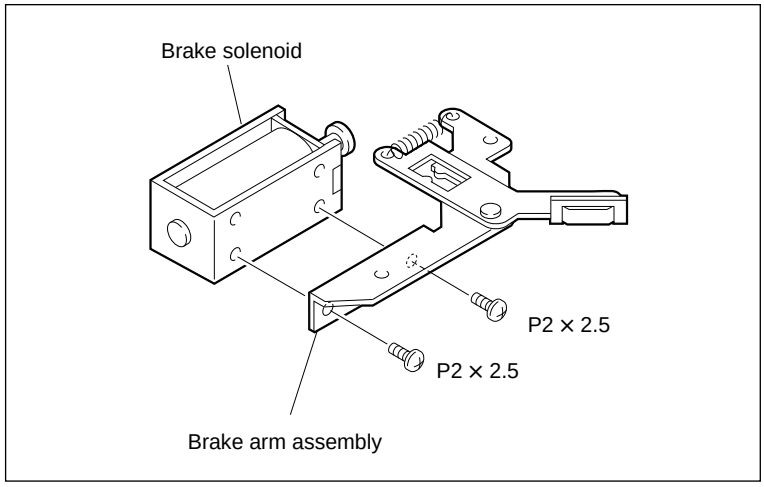
Replacement

1. S brake assembly removal

(1) Remove the two screws.
(2) Remove the S brake assembly while releasing the brake shoe from the S reel table.



(3) Remove the two screws shown in the figure, then remove the brake solenoid from the brake arm assembly.



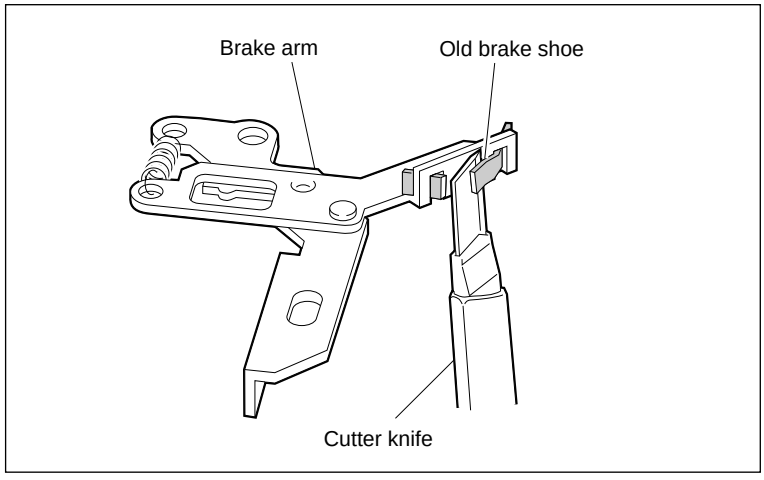
2. Brake shoe replacement

(1) Tear off the old brake shoe from the brake arm.

Note

Remove the glue glops of the old brake shoe completely from the brake arm using a cutter knife.

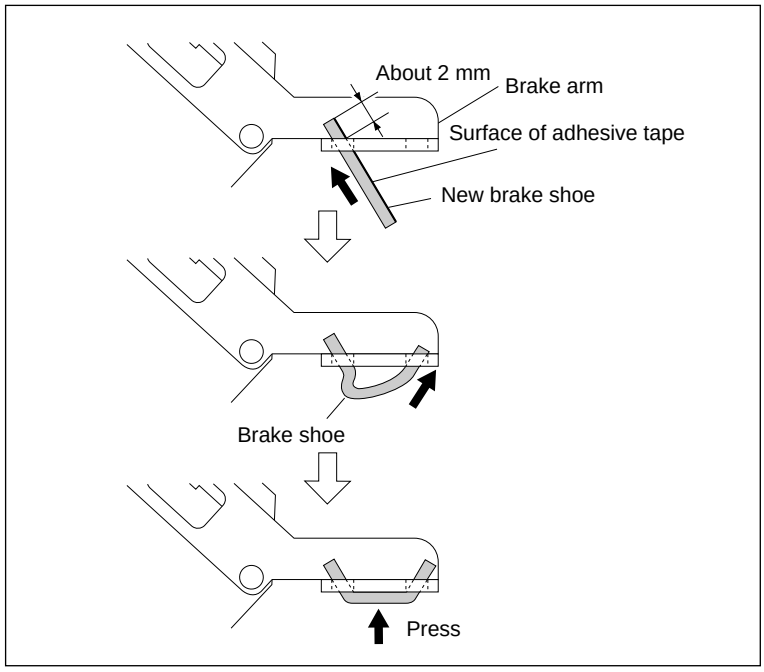
Pay careful attention when handling the cutter knife.



(2) Hold a new brake shoe using tweezers and pass the end of the brake shoe through the hole of the brake arm as shown in the figure.

(3) Pass the other end of the brake shoe through the hole of the brake arm.

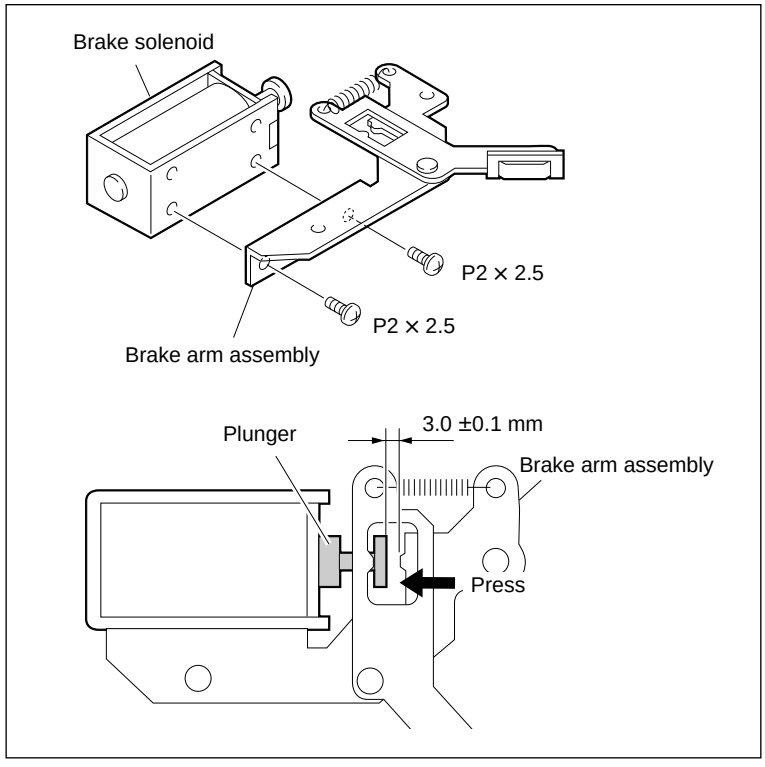
(4) Attach the brake shoe to the brake arm while taking care that the brake shoe is not bent.



3. S brake assembly installation

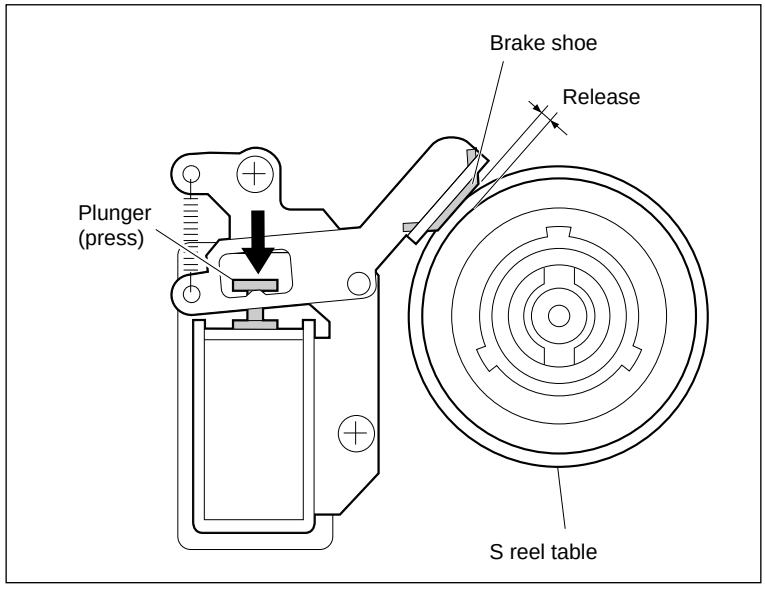
(1) Install the brake solenoid to the brake arm assembly so that the clearance (3.0 ±0.1 mm) exists between the tip of the plunger and brake arm assembly when pressing the plunger in the direction of the arrow by finger.
[Tightening torque: 20×10^{-2} N•m {2.0 kgf•cm}]

(2) Install the S brake assembly in the mechanical deck with two screws.
[Tightening torque: 20×10^{-2} N•m {2.0 kgf•cm}]



4. Operation check

Check that the brake shoe is released from the S reel table when the plunger of the brake solenoid is pushed in the energized direction.



3-13. Capstan Motor Replacement

Outline

Replacement

VH cleaner assembly removal
Timing belt removal
Capstan motor removal
Capstan motor installation
Timing belt installation
VH cleaner assembly installation
Cleaning

Adjustment after replacement

CAPSTAN FG DUTY adjustment
CAPSTAN FRICTION adjustment
CAPSTAN FREE SPEED adjustment
Tape running adjustment
Video tracking check

Precaution

Remove the mechanical deck assembly from the unit when the capstan motor is replaced. Be careful not to damage the video heads, drum, and other parts during removal.

Preparations

1. Turn off the power.
2. Remove the mechanical deck assembly. (Refer to Section 3-1-8.)

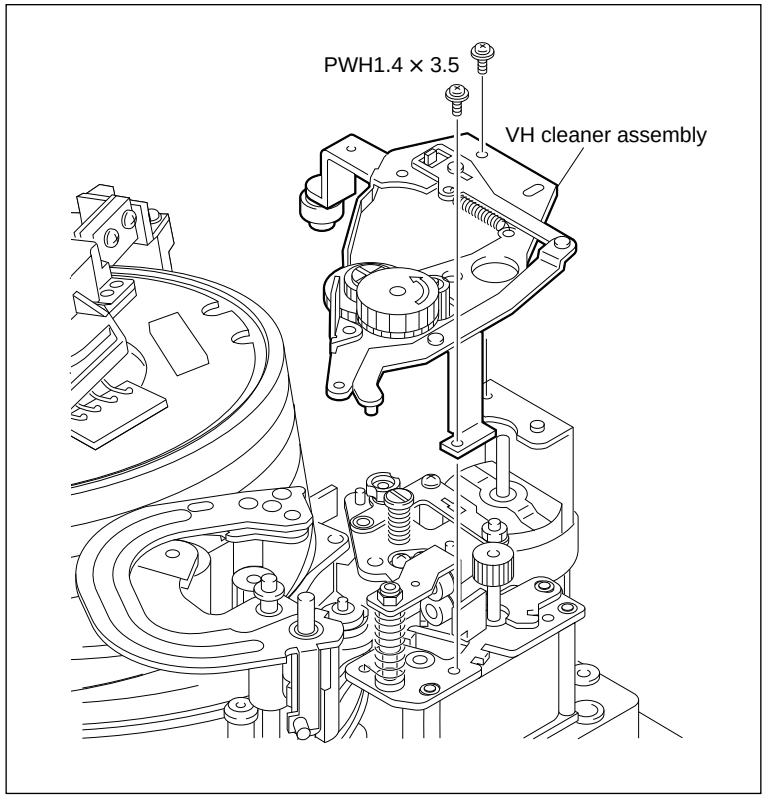
Tools

- Hexagon bit (Across flat has 1.5 mm): J-6326-120-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Removal

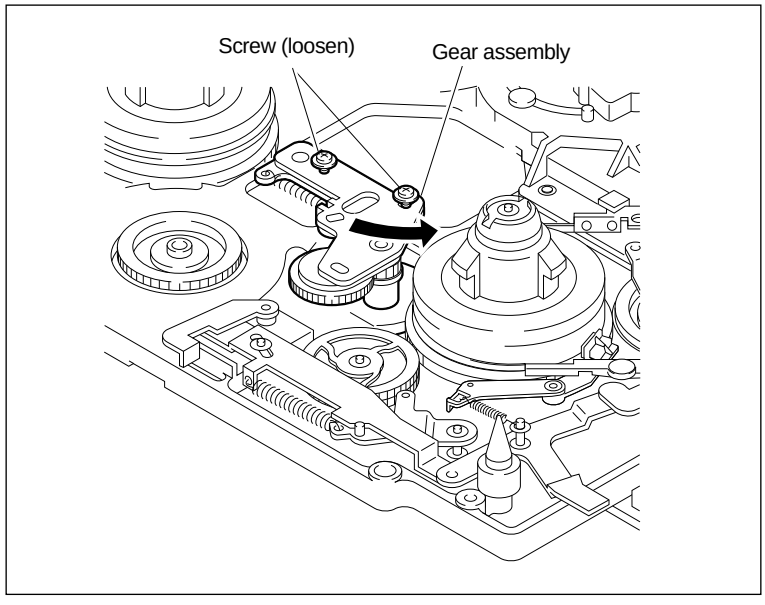
1. VH cleaner assembly removal

Remove the two screws, then remove the VH cleaner assembly.



2. Timing belt removal

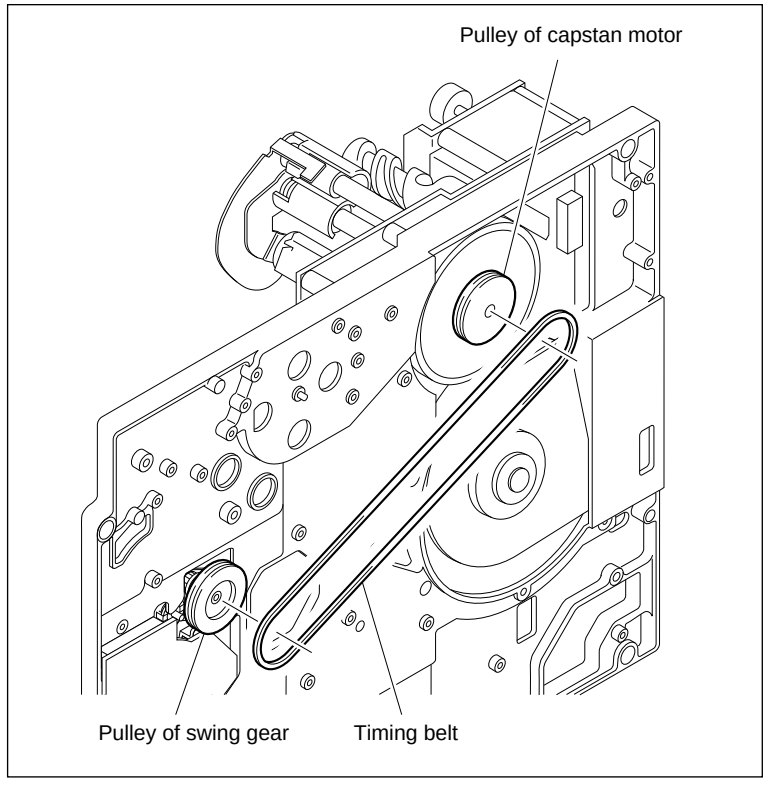
(1) Loosen the two screws shown in the figure of the gear assembly by one half to one turn.



(2) Remove the timing belt at the back of the mechanical deck from the pulley.

Note

Be careful not to stretch or bend the removed timing belt.



3. Capstan motor removal

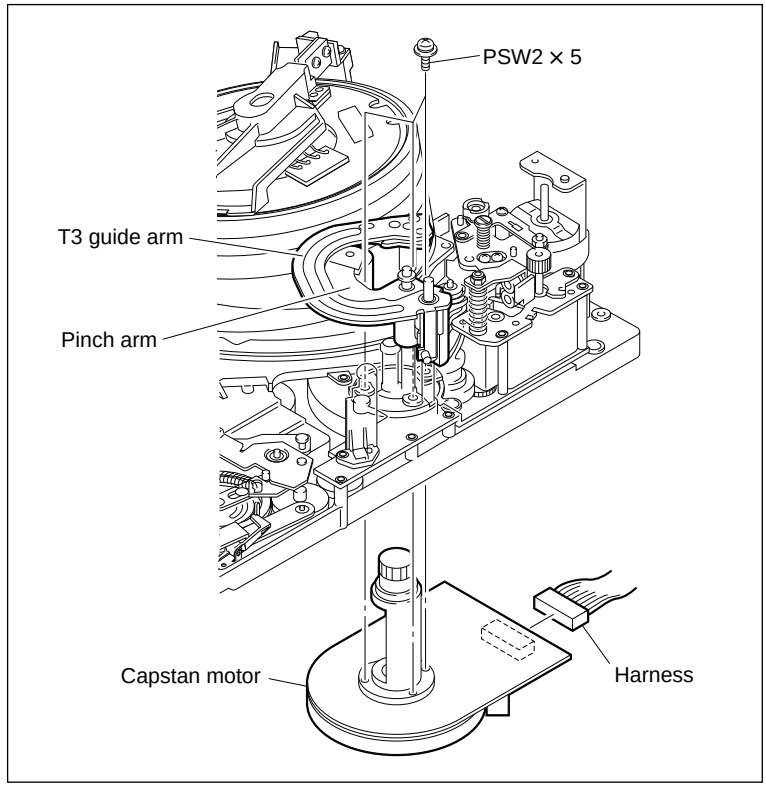
(1) Disconnect the harness connected to the board of the capstan motor. Be careful not to lose the harness because it is used again.

(2) Remove the three screws at the top of the mechanical deck while holding the capstan motor from the back of the mechanical deck assembly by hand.

Note

Move the pinch arm or T3 guide arm to the proper position and remove the three screws. Be careful not to drop these screws on the mechanical deck assembly.

(3) Remove the capstan motor from the back of the mechanical deck assembly.



Installation

4. Capstan motor installation

(1) Pass a new capstan motor through the hole of the mechanical deck assembly in the direction indicated by the figure and tighten it with three screws.

[Tightening torque: 20×10^{-2} N•m
{2.0 kgf•cm}]

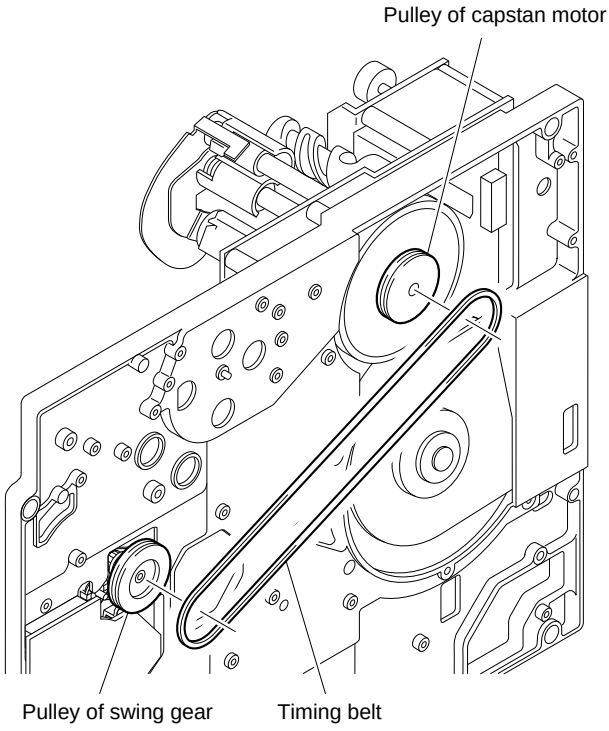
Note

Be careful not to damage the capstan shaft when the new capstan motor is passed through the hole of the mechanical deck assembly.

(2) Connect the harness to the board of the capstan motor.

5. Timing belt installation

(1) Clean the pulleys of the swing gear and capstan motor with cleaning cloth moistened with cleaning fluid.
(2) Put the timing belt removed in procedure 2 on the pulley of the swing gear .
(3) Put the other end of the timing belt on the pulley of the capstan motor.

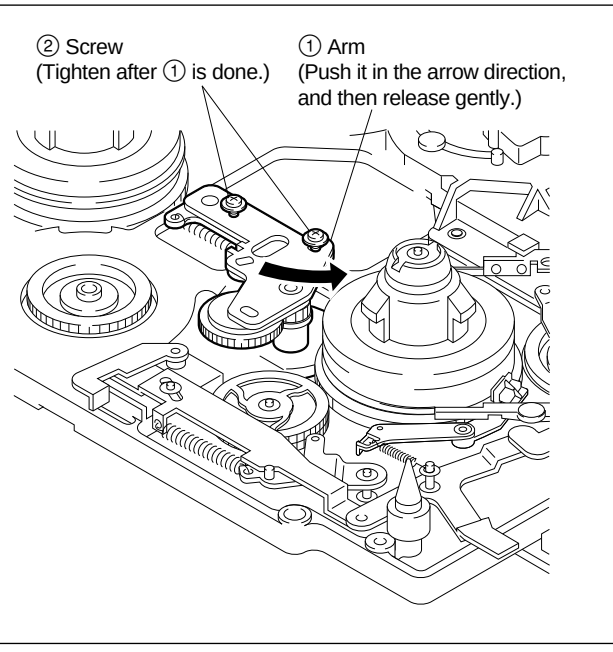


(4) Push the arm of the gear assembly in the direction indicated by the arrow with fingers and release it gently. The arm of the gear assembly slightly returns in the clockwise direction by spring force.
(5) Tighten the two screws loosened in step (1) of procedure 2. At that time, do not hold the arm of the gear assembly with fingers.

Reference

The tension of the timing belt is adjusted by performing steps (4) and (5).

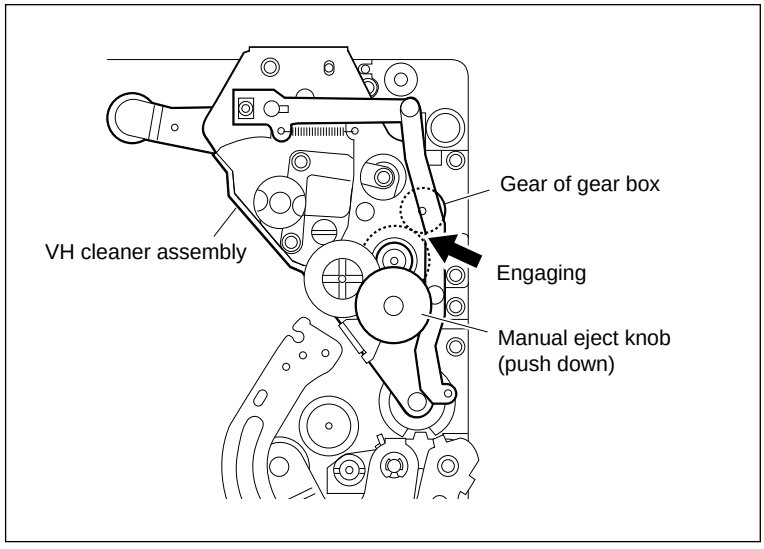
(6) Apply locking fluid to the screws after tightened in step (5). When applying, avoid the slot of the screw.



6. VH cleaner assembly installation

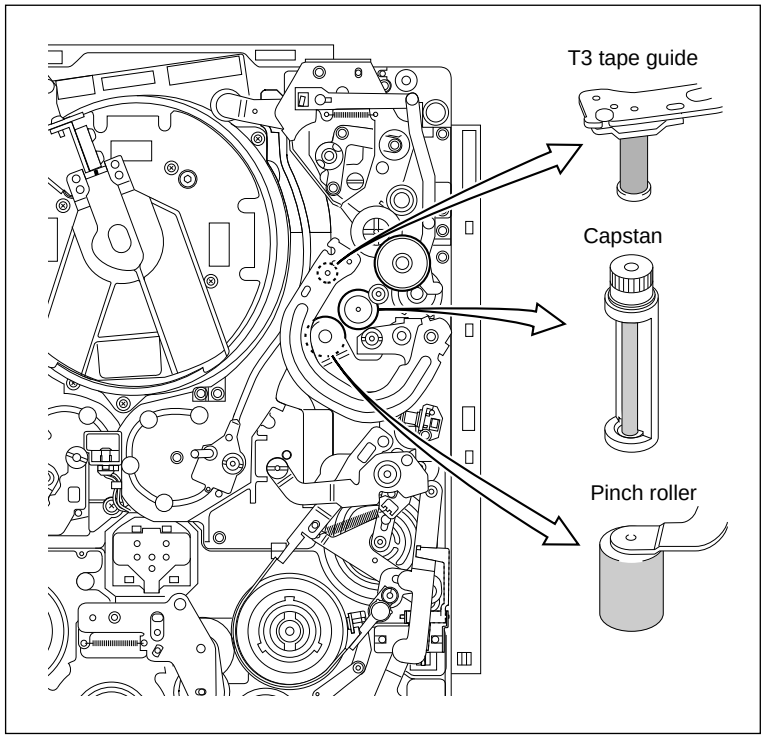
(1) Install the VH cleaner assembly with two screws.
[Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}]

(2) Confirm that the gear of the VH cleaner assembly is engaged with the gear of the gear box when the manual eject knob is pushed down.
(Type B)



7. Cleaning

Clean the surfaces of the capstan motor's shaft, T3 guide, and pinch roller with cleaning cloth moistened with cleaning fluid.



Adjustment after replacement

8. CAPSTAN FG DUTY adjustment

(Refer to Section 2-2-2.)
(A002 : CAPSTAN FG DUTY)

9. CAPSTAN FRICTION adjustment

(Refer to Section 2-2-2.)
(A003 : CAPSTAN FRICTION)

10. CAPSTAN FREE SPEED adjustment

(Refer to Section 2-2-2.)
(A004 : CAPSTAN FREE SPEED)

11. Tape running adjustment

(Refer to Section 5-4.)

12. Video tracking check

(Refer to Section 5-5.)

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3-14. S Reel Motor Replacement

Outline

Replacement

S reel motor removal
S reel motor installation

Adjustment after replacement

S REEL FG DUTY adjustment
Tape running adjustment

Precaution

Remove the mechanical deck assembly from the unit when the S reel motor is rep laced. Be careful not to damage the video heads, drum, and other parts during removal.

Preparations

1. Turn off the power.
2. Remove the mechanical deck. (Refer to Section 3-1-8.)

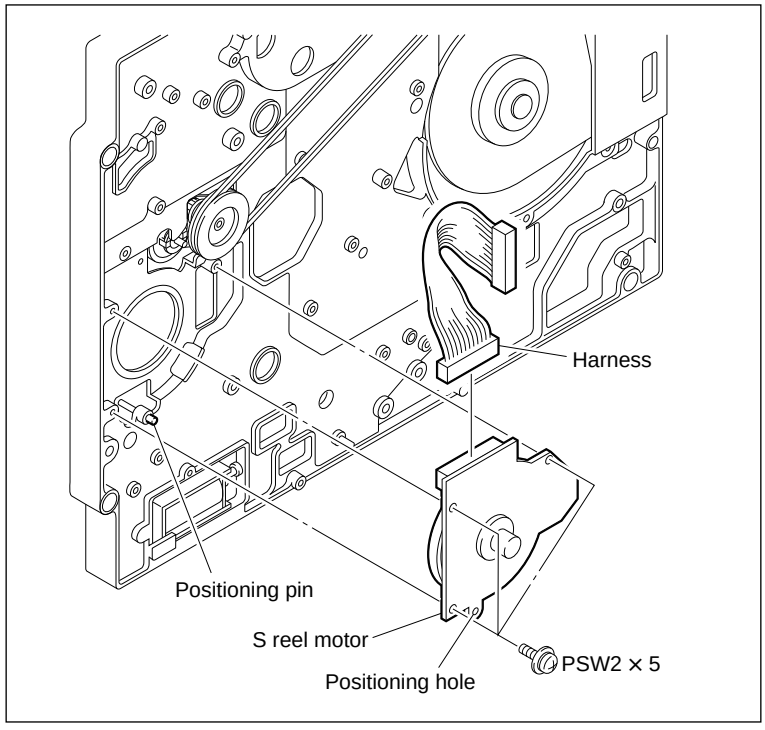
Tools

- Hexagon bit (Across flat has 1.5 mm): J-6326-120-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A

Removal

1. S reel motor removal

(1) Remove the three screws, then remove the S reel motor.
(2) Disconnect the harness from the board of the S reel motor. Be careful not to lose the harness because it is used again.



Installation

2. S reel motor installation

(1) Connect the harness removed in step (2) of procedure 1 to the board of a new S reel motor.

(2) Align the positioning hole of the S reel motor's board with the positioning pin on the mechanical deck and install it with three screws.
[Tightening torque: 20×10^{-2} N•m
{2.0 kgf•cm}]

Adjustment after replacement

3. S REEL FG DUTY adjustment

(Refer to Section 2-2-2.)
(A001 : S REEL FG DUTY)

4. Tape running adjustment

(Refer to Section 5-4.)

3-15. AT Head Replacement

Outline

Replacement

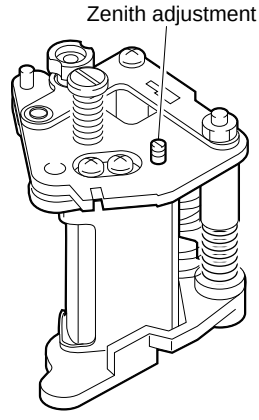
VH cleaner assembly removal
AT head assembly removal
AT head replacement
AT head assembly installation
VH cleaner assembly installation

Adjustment after replacement

Tape running adjustment
Video tracking adjustment
AT head height adjustment
AT head position adjustment
Electrical adjustment after replacing the AT head

Precautions

- Never tighten or loosen the zenith adjustment screw during the AT head replacement
- The following new clamp is required when replacing the AT head.
  Clamp: 3-847-356-02



AT head assembly

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

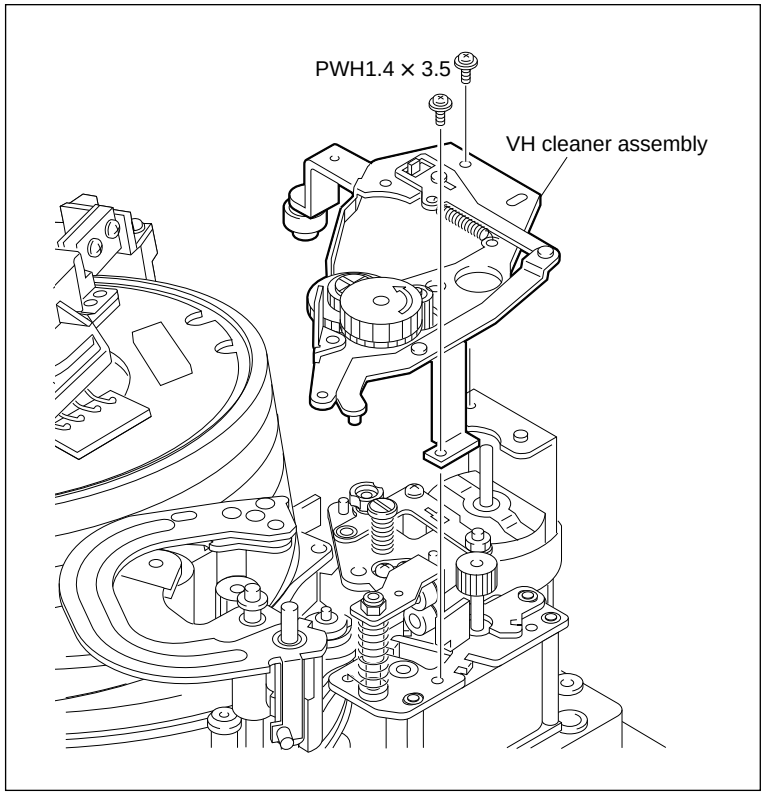
Tools

- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Replacement

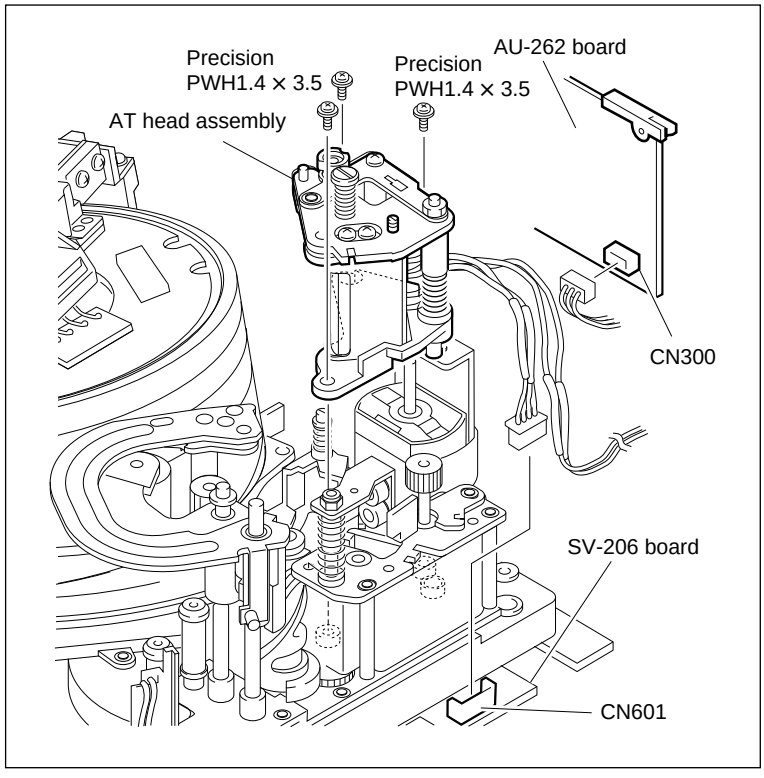
1. VH clearner assembly removal

Remove the two screws, then remove the VH clearner assembly.



2. AT head assembly removal

(1) Disconnect the harness of the AT head from connector CN601 on the SV-206 board.
(2) Pull the AU-262 board out. And then, disconnect the AT head harness from the connector (CN300) on the AU-262 board.
(3) Remove the three precision screws, then remove the AT head assembly.



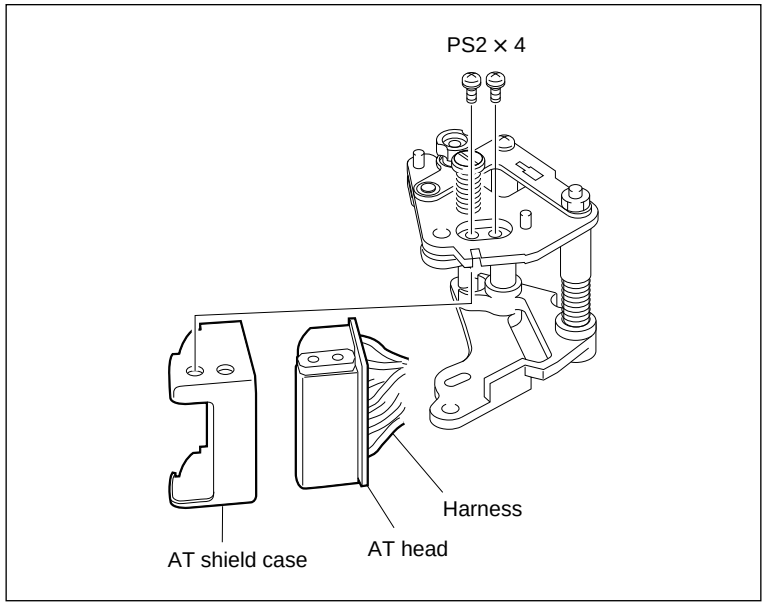
3. AT head replacement

(1) Remove the two screws shown in the figure, then remove the AT head and AT shield case.

(2) Unsolder the harness at the back of the AT head.

Reference

This harness is used again.



(3) Solder the harness removed in step (2) to the printed circuit board of a new AT head as shown in the figure.

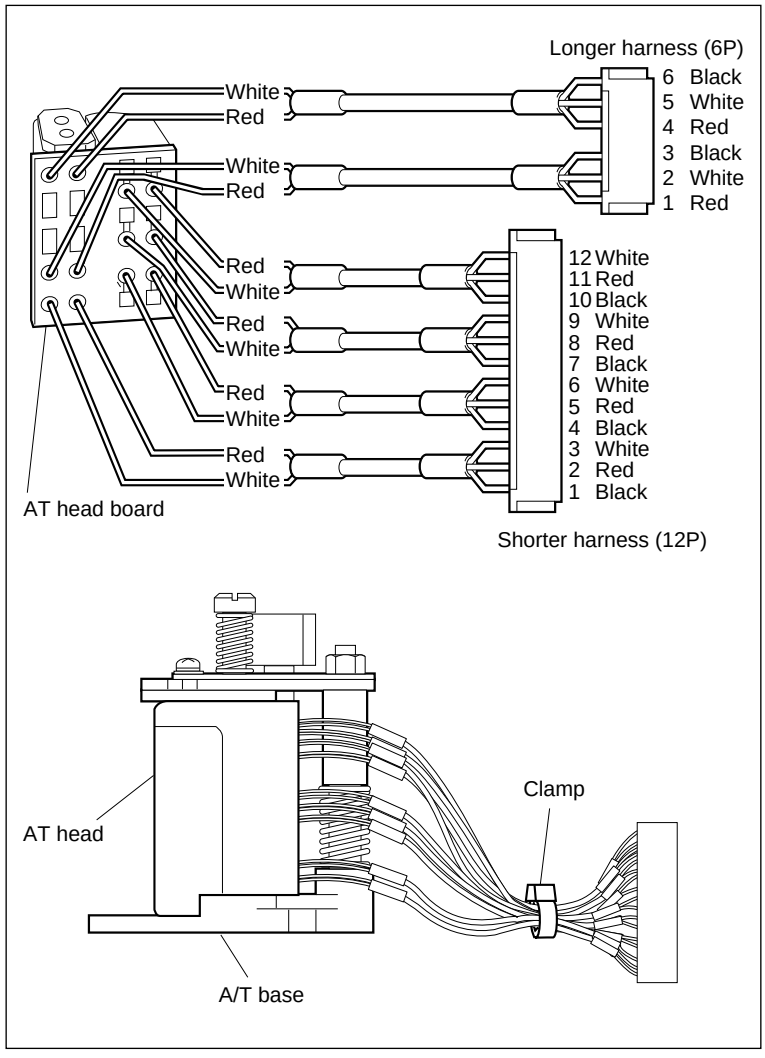
Note

Be sure to solder the harness in a correct positions.

(4) Put the AT shield plate on the new AT head.

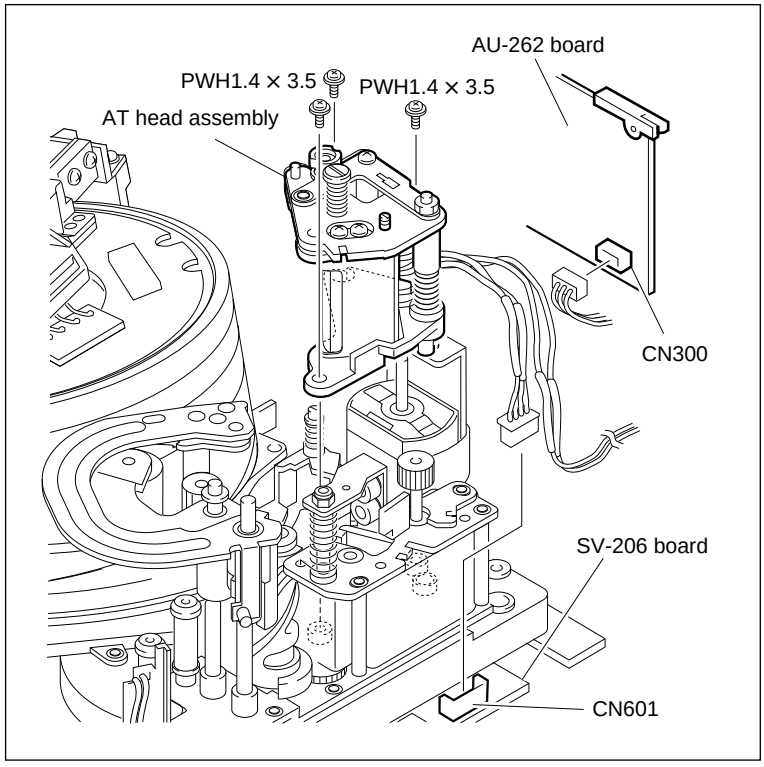
(5) Install the AT head with two screws.
[Tightening torque: 20×10^{-2} N•m
{2.0 kgf•cm}]

(6) Fix the harnesses onto the AT base using the new clamp (3-847-356-02).



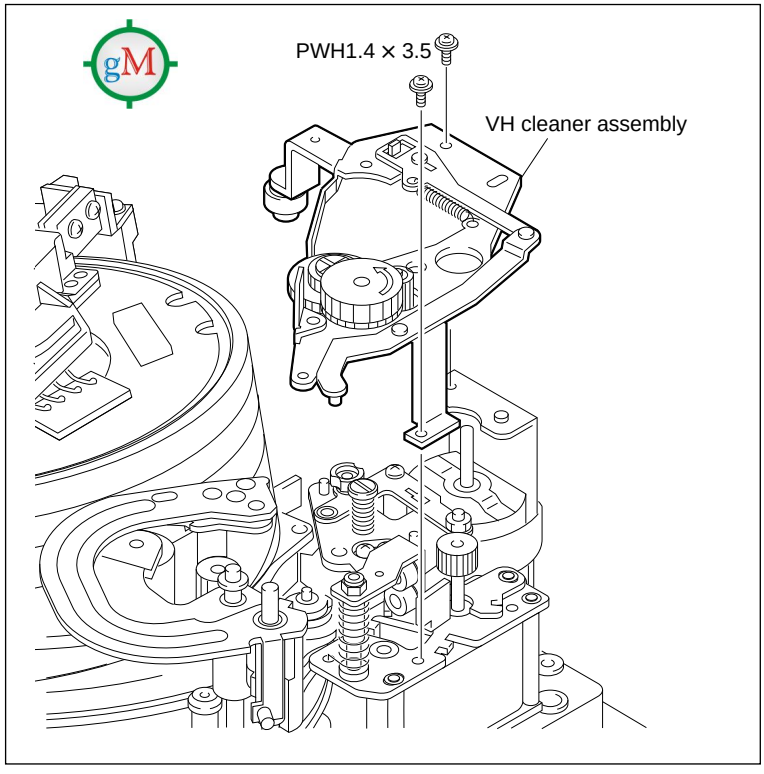
4. AT head assembly installation

(1) Align the boss of the AT head assembly with the hole of the mechanical deck and install it with three screws.
(2) Connect the harness (shorter) of the AT head to connector CN601 on the SV-206 board.
(3) Connect the harness (longer) of the AT head to connector CN300 on the AU-262 board.
(4) Clean the AT head surface with cleaning cloth moistened with cleaning fluid.



5. VH clearner assembly installation

(1) Install the VH clearner assembly with two screws.
[Tightening torque: 9×10^{-2} N•m
{0.9 kgf•cm}]
(2) Confirm that the gear of the VH clearner assembly is engaged with the gear of the gear box when the manual eject knob is pushed down.



Adjustment after replacement

6. Tape running adjustment
(Refer to Section 5-4.)

7. Video tracking adjustment
(Refer to Section 5-5.)

8. AT head height adjustment
(Refer to Section 5-9.)

9. AT head position adjustment
(Refer to Section 5-8.)

10. Electrical adjustment after replacing the AT head
(Refer to Section 6-3.)

Section 4
Main Parts Replacement

4-1. Threading Motor Replacement

Outline

Replacement

VH cleaner assembly removal
AT head assembly removal
Threading motor assembly removal
Threading motor replacement
Threading motor assembly installation
AT head assembly installation
VH cleaner assembly installation

Adjustment after replacement

AT head position adjustment

Precautions

- The threading motor can be replaced with the cassette compartment installed.
- The following new loading motor pulley is required when replacing the threading motor.
  Loading motor pulley: 3-611-492-01

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A

Replacement

1. VH cleaner assembly removal

Remove the VH cleaner assembly.
(Refer to Section 3-6.)

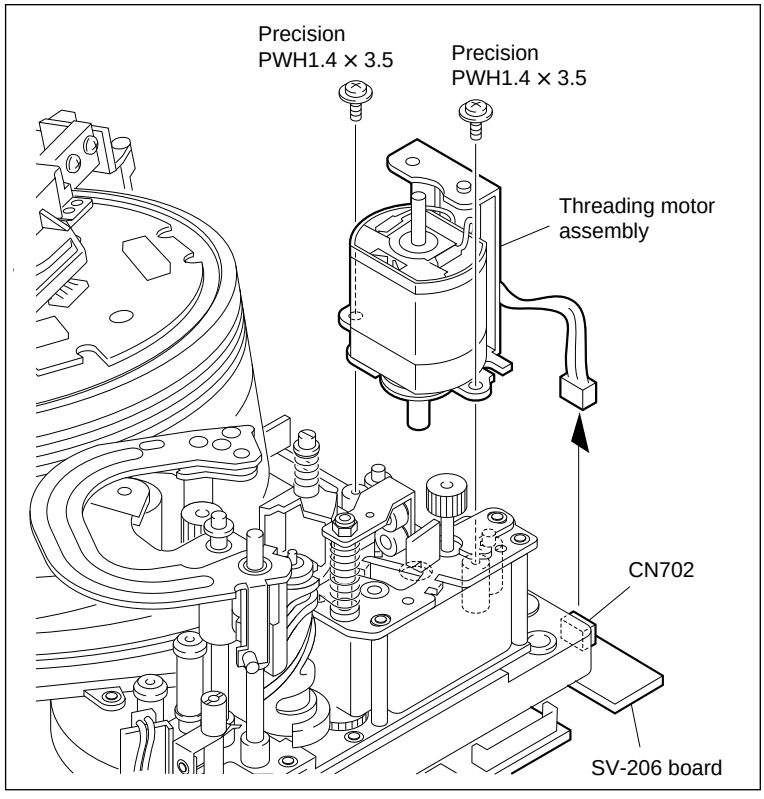
2. AT head assembly removal

Remove the AT head assembly.
(Refer to Section 3-15.)

3. Threading motor assembly removal

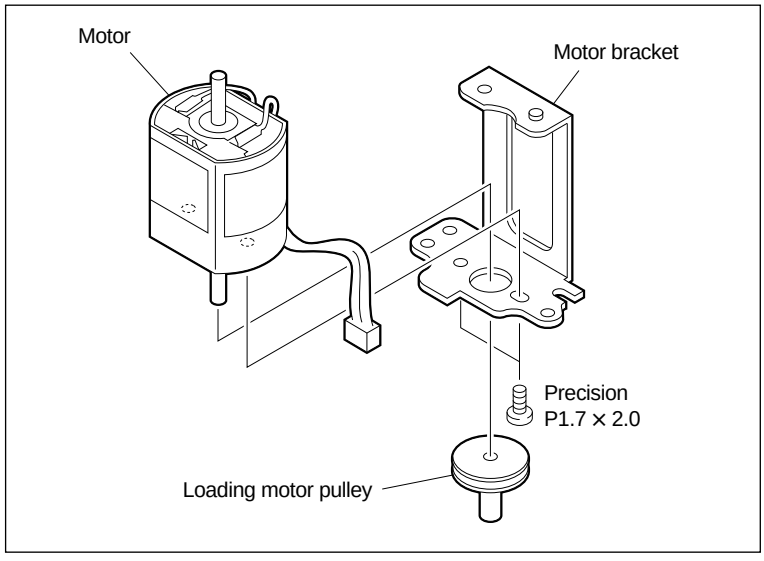
(1) Disconnect connector CN702 on the SV-206 board.

(2) Remove the two precision screws, then remove the threading motor assembly. Leave the timing belt on the mechanical deck.



4. Threading motor replacement

(1) Remove the two precision screws, and then remove the motor from the motor bracket.



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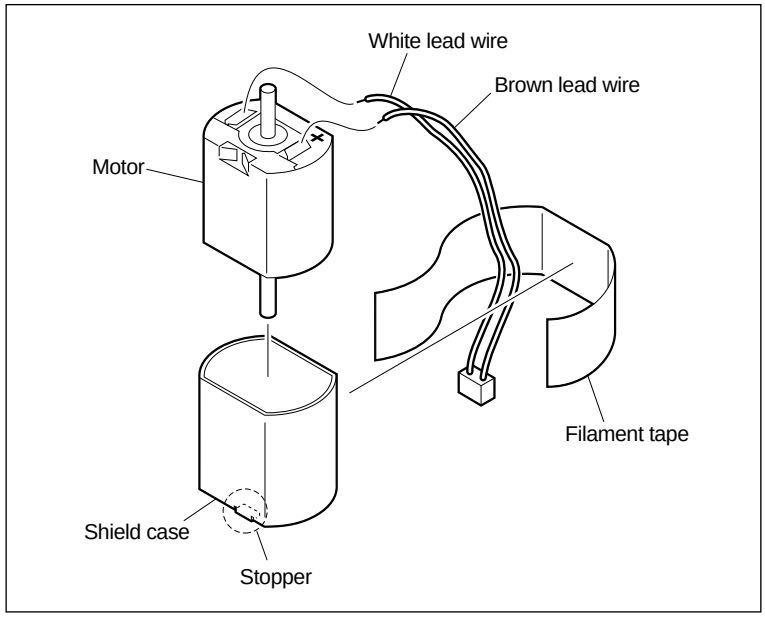
(2) Put a new motor into the shield case in the direction shown in the figure.
(3) Unsolder the two wires from the removed motor.
(4) Unsolder the two wires soldered to a new motor, and solder the wires unsoldered in step (3) to the terminals.

Note

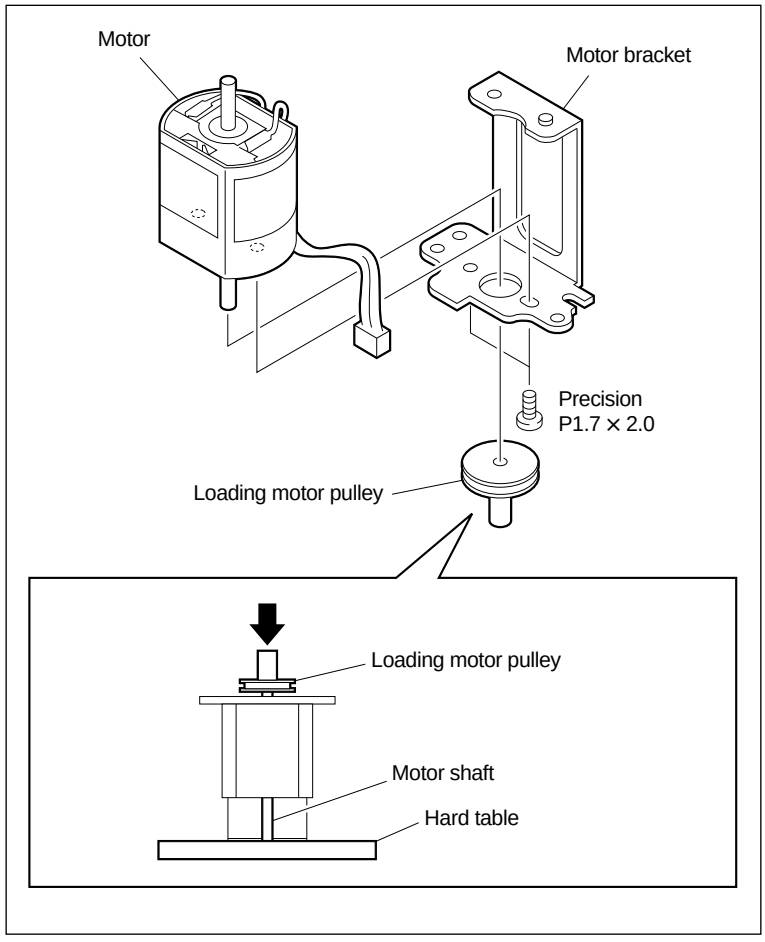
Solder the brown lead wire to the terminal with positive polarity.



(5) Fix the wires to the shield case using filament tape as shown in the figure.
(6) Install the motor in the motor bracket with the two precision screws.
(Tightening torque: 20×10^{-2} N•m {2.0 kgf•cm})
(7) Press a new loading motor pulley to the motor shaft as far as it will go.

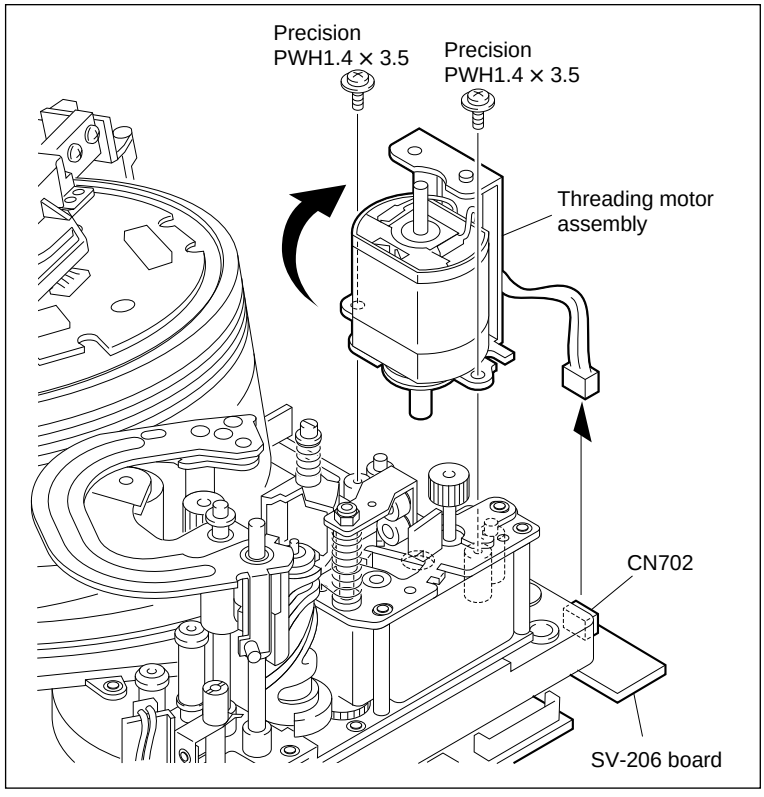
Note

Be sure to put the other end of the motor shaft on a hard table when pressing as shown in the figure.



5. Threading motor assembly installation

(1) Put the threading motor assembly onto the mechanical deck while hooking the timing belt on the pulley of the threading motor assembly.
(2) While pushing the motor assembly in the direction of the arrow, secure it with the two precision screws.
(3) Connect the connector of the threading motor to CN702 on the SV-206 board.



6. AT head assembly installation

Install the AT head assembly.
(Refer to Section 3-15.)

7. VH cleaner assembly installation

Install the VH cleaner assembly.
(Refer to Section 3-6.)

Adjustment after replacement

8. AT head position adjustment

(Refer to Section 5-8.)

4-2. Gear in Gear Box Replacement

Outline

Replacement

VH cleaner assembly removal
AT head assembly removal
Plate(2) removal
Gear box housing removal
GB(2) gear assembly replacement
GB(1) gear assembly replacement
GB(3) gear assembly replacement
Gear box housing installation
Plate(2) installation
ME gear installation
Timing belt installation check
AT head assembly installation
VH cleaner assembly installation

Adjustment after replacement

AT head position adjustment

Precautions

- The gear in a gear box can be replaced with the cassette compartment installed.
- Bearings are provided at the tip of each gear assembly. Be careful not to lose them during removal and installation.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Grease (PG-662): 7-651-000-59
- Tweezers

Replacement

1. VH cleaner assembly removal

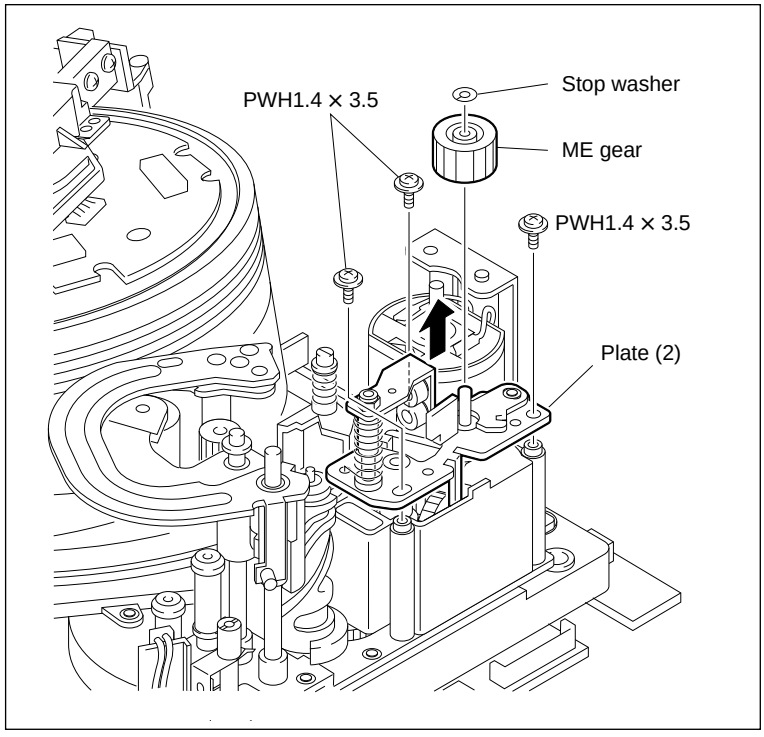
Remove the VH cleaner assembly.
(Refer to Section 3-6.)

2. AT head assembly removal

Remove the AT head assembly.
(Refer to Section 3-15.)

3. Plate(2) removal

(1) Remove the stop washer, and remove the ME gear.
(2) Remove the three screws, then remove the plate(2) in the direction indicated by the arrow.

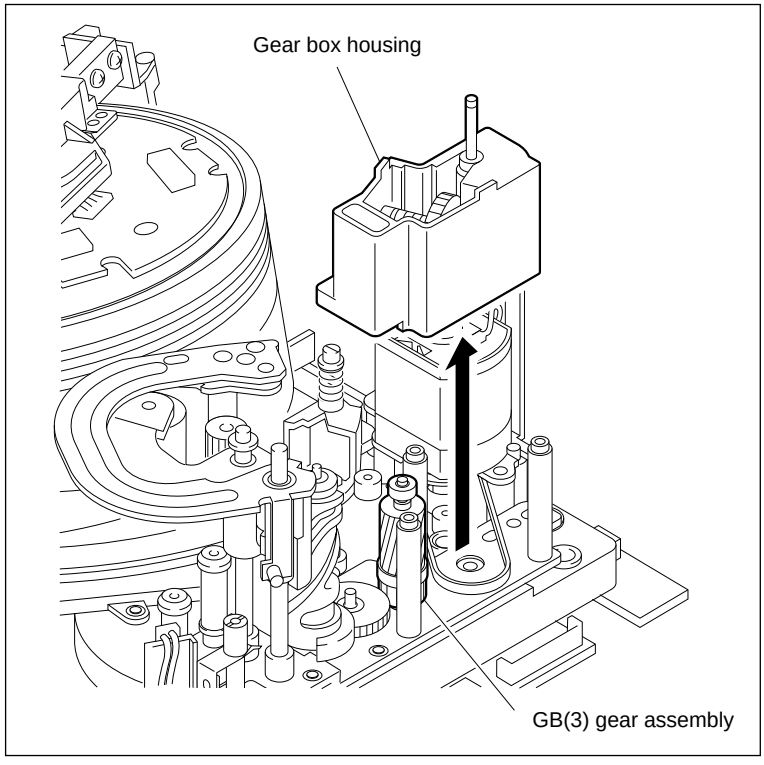


4. Gear box housing removal

Lift the gear box housing up, then remove it. At that time, the two gears (GB(1) gear assembly with ME gear and GB(2) gear assembly) in the housing are removed together. The GB(3) gear assembly is left on the mechanical deck.

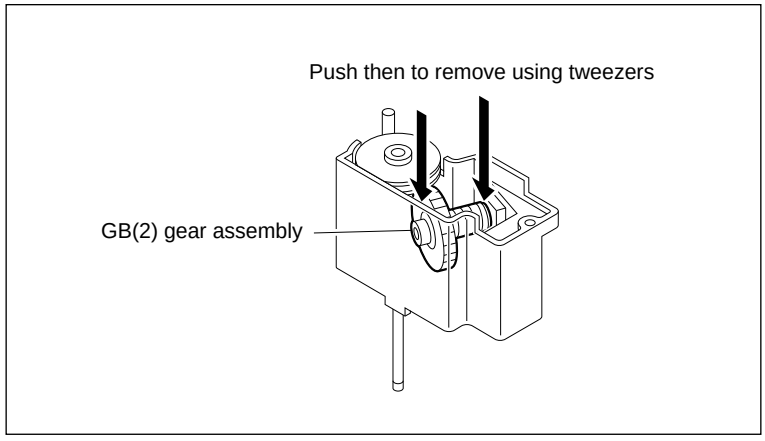
Note

Bearings are provided at the tip of each gear shaft. Be careful not to lose them.

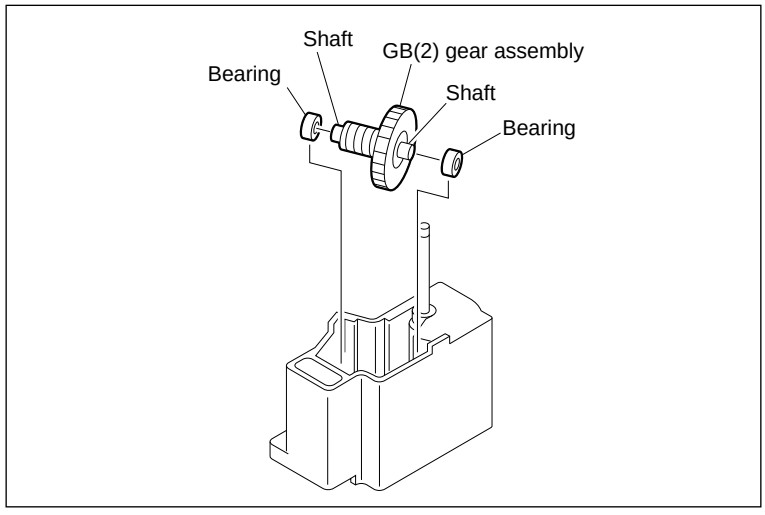


5. GB(2) gear assembly replacement

(1) Push and remove both ends of the GB(2) gear assembly from the back of the gear box housing using tweezers.

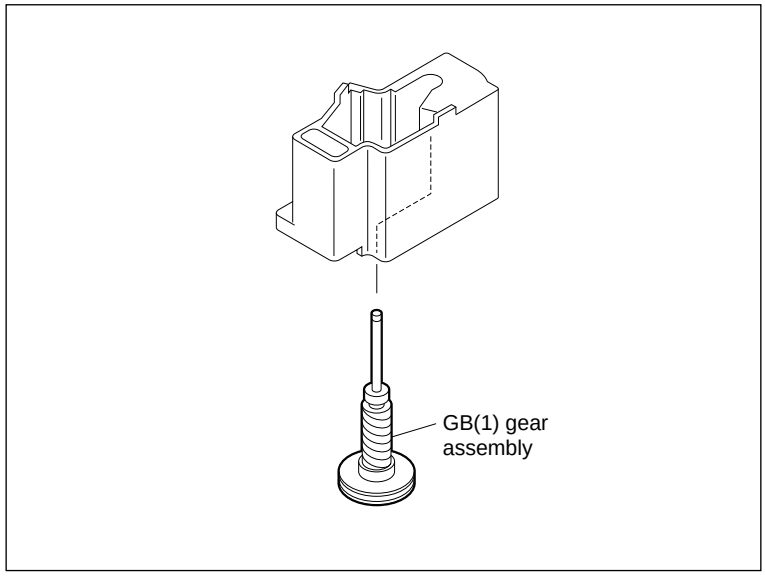


(2) Remove the bearings from the shafts on both ends of the removed GB(2) gear assembly.
(3) Clean the shafts on both ends of a new GB(2) gear assembly with dry cloth.
(4) Install bearings in the shafts on both ends of the GB(2) gear assembly.
(5) Apply grease thinly to the whole gear circumference of the GB(2) gear assembly.
(6) Insert the GB(2) gear assembly from the top of the gear box housing in the direction shown in the figure, push both ends of the assembly using tweezers, then install it securely.



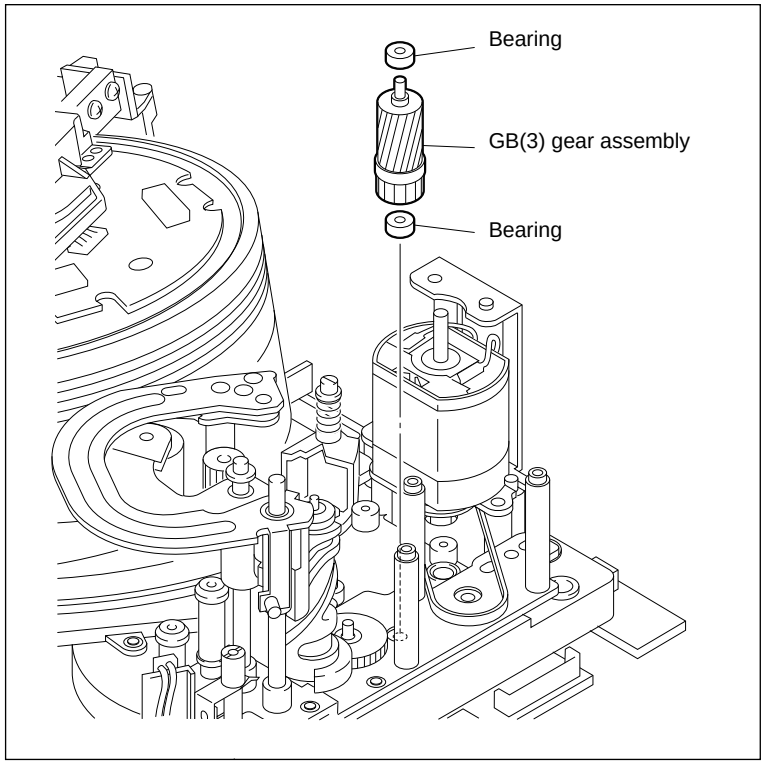
6. GB(1) gear assembly replacement

(1) Remove the GB(2) gear assembly. (Refer to (1) in step 5 above.)
(2) Remove the GB(1) gear assembly from the gear box housing.
(3) Replace the GB(1) gear assembly with a new one.
(4) Insert the GB(1) gear assembly into the gear box housing and install the GB(2) gear assembly. (Refer to (6) in step 5 above.)



7. GB(3) gear assembly replacement

(1) Remove the bearings in the shafts on both ends of the GB(3) gear assembly.
(2) Clean the shafts from both ends of a new GB(3) gear assembly with dry cloth.
(3) Install bearings in the shafts on both ends of the GB(3) gear assembly.



8. Gear box housing installation

(1) Insert the bearing of the GB(3) gear assembly into the hole shown in the figure and put up the gear assembly.

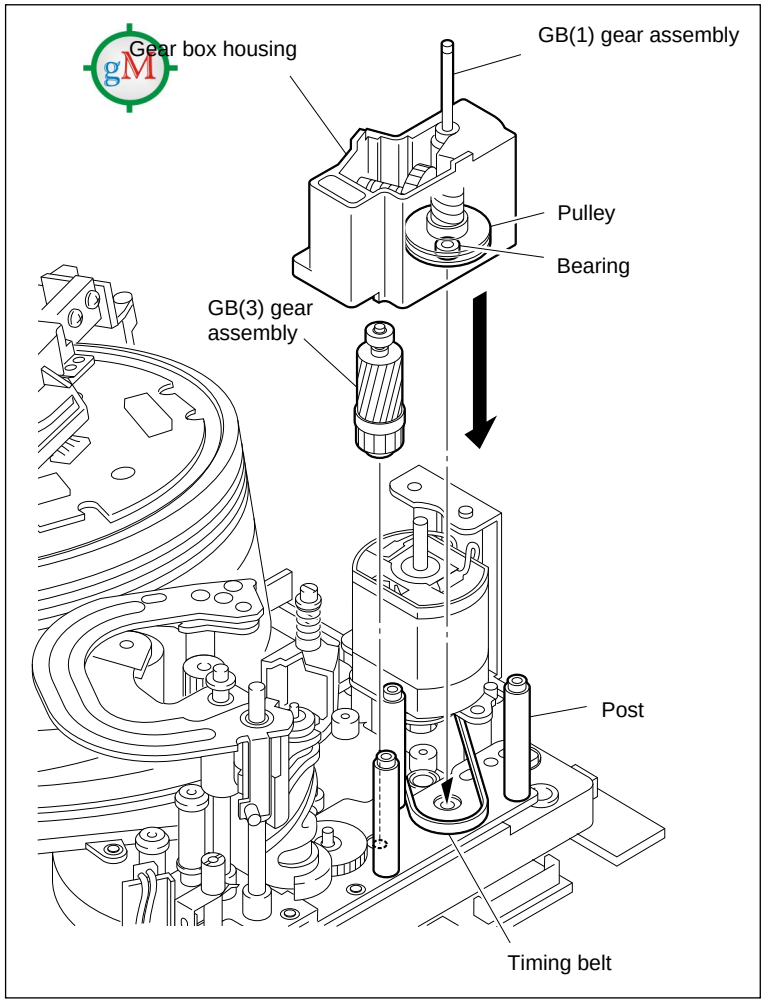
Note

Be careful not to lose the bearing during installation.

(2) Put the gear box housing among the three posts on the mechanical deck as shown in the figure, and push it to the position where the pulley at the tip of the GB(1) gear assembly touches the timing belt.
(3) Put the timing belt on the pulley using tweezers and insert the bearing at the tip of the GB(1) gear assembly firmly into the hole of the mechanical deck.
(4) Push the gear box housing toward the mechanical deck as far as it will go.

Note

Be careful not to interpose the timing belt between the gear box housing and mechanical deck at that time.



9. Plate(2) installation

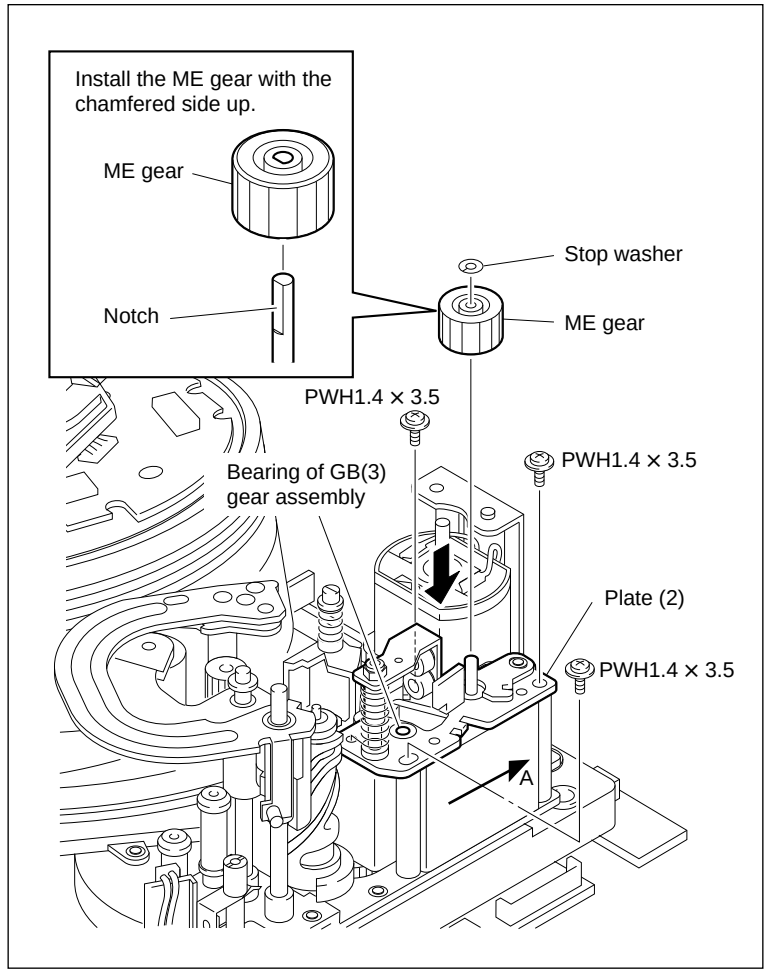
(1) Install the plate(2) into the gear box housing, and confirm that the bearing at the tip of the GB(3) gear assembly is firmly put into the hole of plate(2).
(2) While moving the plate(2) in the direction of the arrow A, fasten the plate(2) with the three screws.

10. ME gear installation

Install the ME gear with a new stop washer.

Note

Align the notch at the tip of the shaft with the hole of the ME gear when the ME gear is installed.



11. Timing belt installation check

Check that the timing belt is put on the pulley of the threading motor. If the timing belt is not put, remove the threading motor assembly from the mechanical deck once, then put the timing belt on the pulley.

12. AT head assembly installation

Install the AT head assembly.
(Refer to Section 3-15.)

13. VH cleaner assembly installation

Install the VH cleaner assembly.
(Refer to Section 3-6.)

Adjustment after replacement

14. AT head position adjustment

(Refer to Section 5-8).

4-3. Full Erase Head Replacement

Outline

Replacement

CTL/FE head assembly removal
Full erase head removal
Full erase head replacement
CTL/FE head assembly installation
CTL/FE head assembly cleaning

Adjustment after replacement

Tape running adjustment

CAUTION

Never contact the tape cleaner at the entrance head block with bare hands. The tape cleaner has a sharp edge. Pay careful attention when the full erase head is replaced or adjusted.

Precaution

The full erase head can be replaced with the cassette compartment installed in the unit.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Replacement

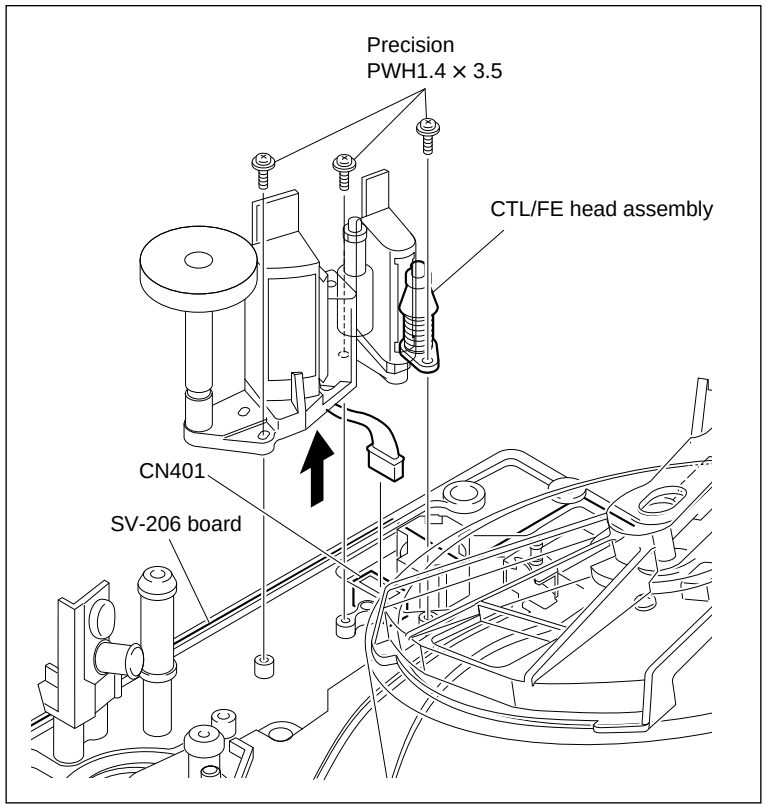
1. CTL/FE head assembly removal

(1) Disconnect connector CN401 on the SV-206 board.

(2) Remove the three precision screws, then remove the CTL/FE head assembly from the unit.

Note

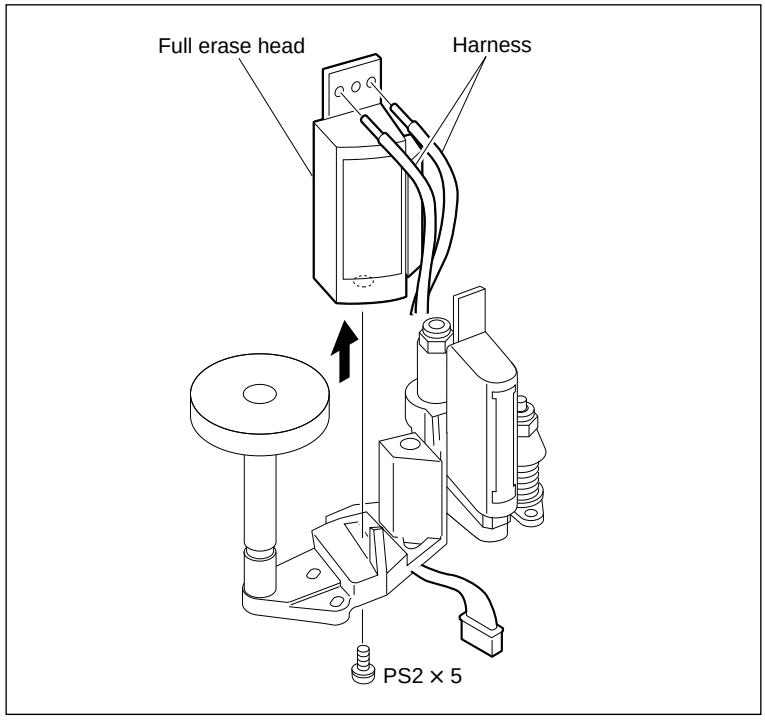
Be careful not to damage the video head, drum, tape guide and other parts with a screwdriver.



2. Full erase head removal

(1) Unsolder the two harnesses soldered to the full erase head.

(2) Remove the one screw at the back of the CTL/FE head assembly, then remove the full erase head.



3. Full erase head replacement

CAUTION

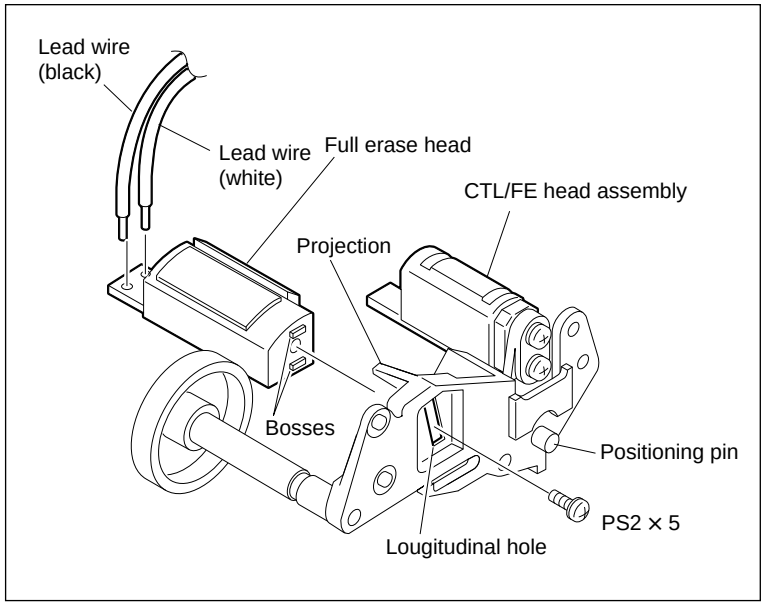
The full erase head is equipped with the tape cleaner which has a sharp edge.
Do not touch it with bare hands. Pay careful attention when servicing.

(1) Put the two bosses of a new full erase head into the longitudinal hole of the CTL/ FE head assembly and install it with one screw. At that time, tighten the screw while pushing the head surface toward the projection.
[Tightening torque: 20×10^{-2} N•m
{2.0 kgf•cm}]

(2) Solder the two harnesses to the printed circuit board of the full erase head.

Note

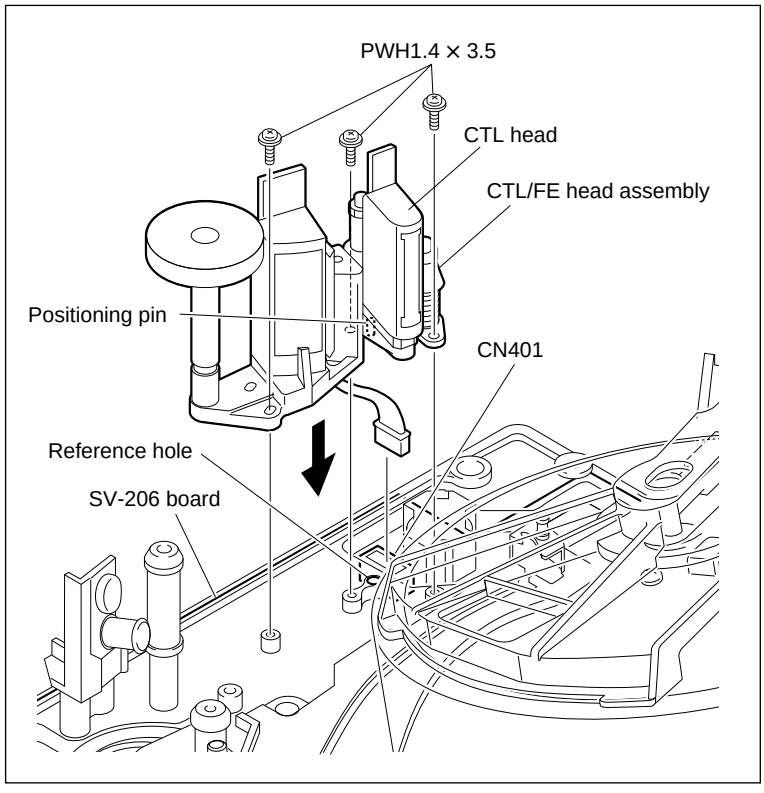
Be sure to solder the wires in the correct positions.



4. CTL/FE head assembly installation

(1) Insert the positioning pin of the CTL/FE head assembly into the reference hole on the mechanical deck and install it with three screws.

(2) Connect the harness of the CTL/FE head assembly to connector CN401 on the SV-206 board.



5. CTL/FE head assembly cleaning

Clean the CTL head, full erase head, tape cleaner and tape guide with cleaning cloth moistened with cleaning fluid.

Note

After cleaning, be sure to wipe with dry cloth.

Adjustment after replacement

6. Tape running adjustment

(Refer to Section 5-4.)

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4-4. S Brake Solenoid Replacement

Outline

Replacement

Mechanical deck removal
SV-206 board removal
Cassette compartment removal
S brake assembly removal
Brake solenoid replacement
S brake assembly installation
Solenoid operation check
Cassette compartment installation
SV-206 board installation
Mechanical deck installation

Check after replacement

Tape running check
Video tracking check
CTL head position check
AT head position check

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Hexagon bit (for torque driver): J-6326-120-A

Replacement

1. Mechanical deck removal

Remove the mechanical deck.
(Refer to Section 3-1-8.)

2. SV-206 board removal

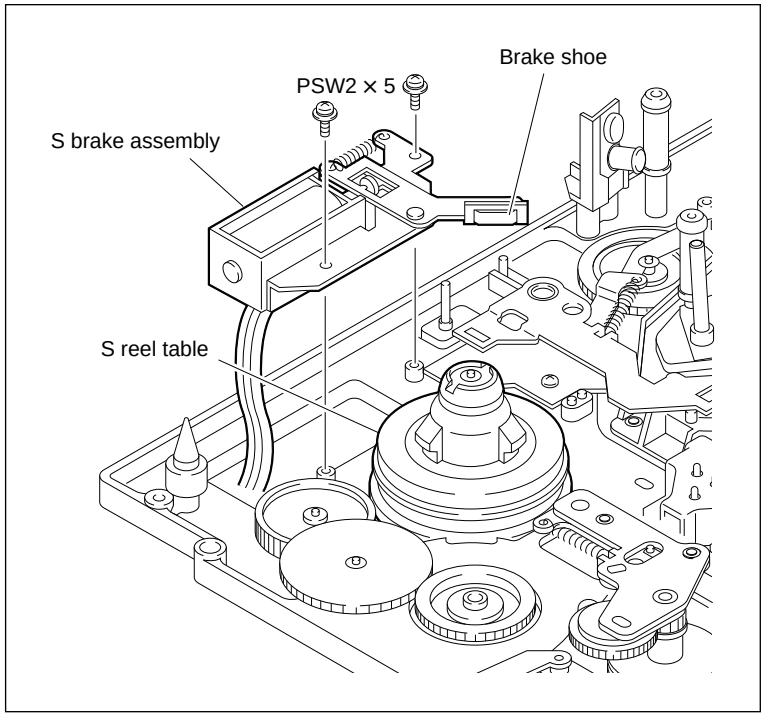
Remove the SV-206 board.
(Refer to Section 4-18-1.)

3. Cassette compartment removal

Remove the cassette compartment.
(Refer to the maintenance manual Part 1, Section 1-7.)

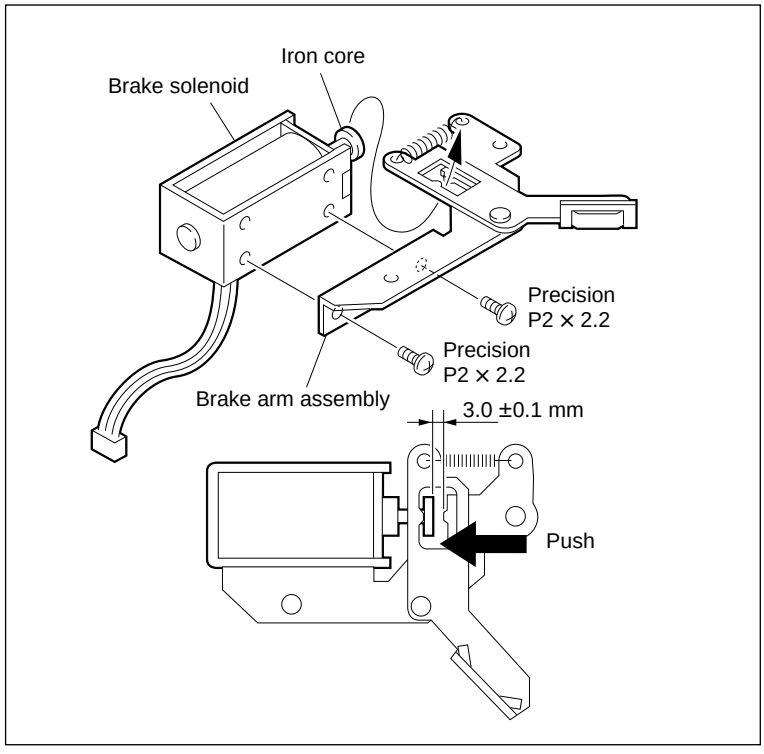
4. S brake assembly removal

Remove the two screws, then remove the S brake assembly while releasing the brake shoe from the S reel table.



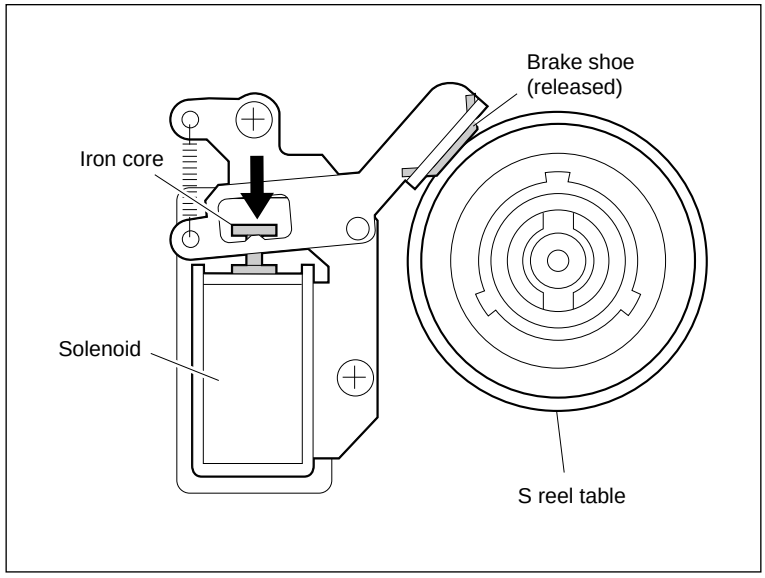
5. Brake solenoid replacement

(1) Remove the two precision screws shown in the figure, then remove the brake solenoid.
(2) Fix a new brake solenoid tentatively to the brake arm assembly in the direction shown in the figure with two screws while inserting the iron core tip of a new brake solenoid into the hole of the brake arm assembly.
(3) Position the brake solenoid so that the gap between the tip of iron core and the protrusion of brake arm assembly is 3.0 ±0.1 mm when pushing down the iron core in the direction of the arrow by a finger and tighten it with the two screws.
[Tightening torque: 20×10^{-2} N•m
{2.0 kgf•cm}]



6. S brake assembly installation

(1) Pass the harness of the S brake assembly through the square hole on the mechanical deck.
(2) Install the S brake assembly in the mechanical deck with two screws.



7. Solenoid operation check

(1) Check that the brake is applied when the S reel table is manually turned in the clockwise direction.
(2) Check that the brake shoe is released from the S reel table and that the S reel table smoothly rotates in the clockwise direction by hand when the iron core of the solenoid is pushed in the energized direction with fingers.

8. Cassette compartment installation

Install the cassette compartment. (Refer to the maintenance manual Part 1, Section 1-7.)

9. SV-206 board installation

Install the SV-206 board.
(Refer to Section 4-18-1.)

10. Mechanical deck installation

Install the mechanical deck.
(Refer to Section 3-1-8.)

Check after replacement

11. Tape running check

(Refer to Section 5-4.)

12. Video tracking check

(Refer to Section 5-5.)

13. CTL head position check

(Refer to Section 5-7.)

14. AT head position check

(Refer to Section 5-8.)

4-5. S/T Slider Replacement

Outline

Replacement

VH cleaner assembly removal
Pinch arm assembly removal
Drum assembly removal
T tension regulator arm removal
Tension regulator band removal
S tension regulator arm removal
Full top sensor removal
S and T catchers removal
Threading link assembly removal
Slider replacement
Threading link assembly installation
S and T catchers installation
Full top sensor installation
Tension regulator band installation
T tension regulator arm installation
S tension regulator arm installation
Drum assembly installation
Pinch arm assembly installation
VH cleaner assembly installation

Adjustment after replacement

Tape running adjustment
Video tracking adjustment
CTL head position adjustment
AT head position adjustment

Precautions

- The four new stop washers and an E ring are required when replacing the S/T slider.
  E ring (for pinch arm assembly): 7-624-105-04 (2.3) × 1
  Stop washer: 3-559-408-11 × 4 (for S/T sliders, tension regulator band, and T tension arm)
- The two parallel pins (d = 2.0 mm) are required as tools for gear phase adjustment.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

Tools

- Stop washer fastening tool: J-6323-530-A
- Torque screwdriver (3 kg•cm) : J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Parallel pin (d = 1.6 mm): 3-649-266-01
- Parallel pin (d = 2.0 mm): 3-703-358-04

Replacement

1. VH cleaner assembly removal
Remove the VH cleaner assembly.
(Refer to Section 3-6.)

2. Pinch arm assembly removal
Remove the pinch arm assembly.
(Refer to Section 3-7.)

3. Drum assembly removal
Remove the drum assembly.
(Refer to Section 3-5.)

4. T tension regulator arm removal
Remove the T tension regulator arm.
(Refer to Section 3-9.)

5. Tension regulator band removal
Remove the tension regulator band.
(Refer to Section 3-9.)

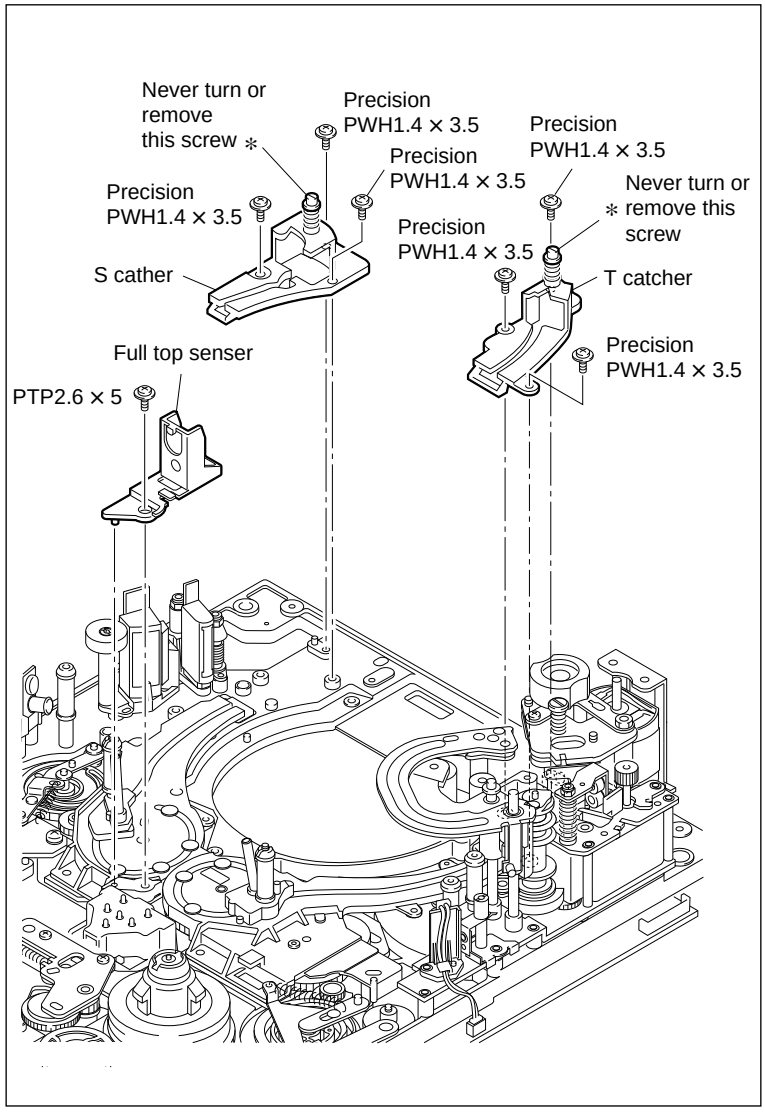
6. S tension regulator arm removal
Remove the two screws, and then remove the S tension regulator arm. (Refer to Section 4-10.)

7. Full top sensor removal
Remove the screw, and then remove the full top sensor.

8. S and T catchers removal
Remove the three screws respectively, and then remove the S catcher, and T catcher.

Note

Never turn or remove the screws (*) shown in the figure.

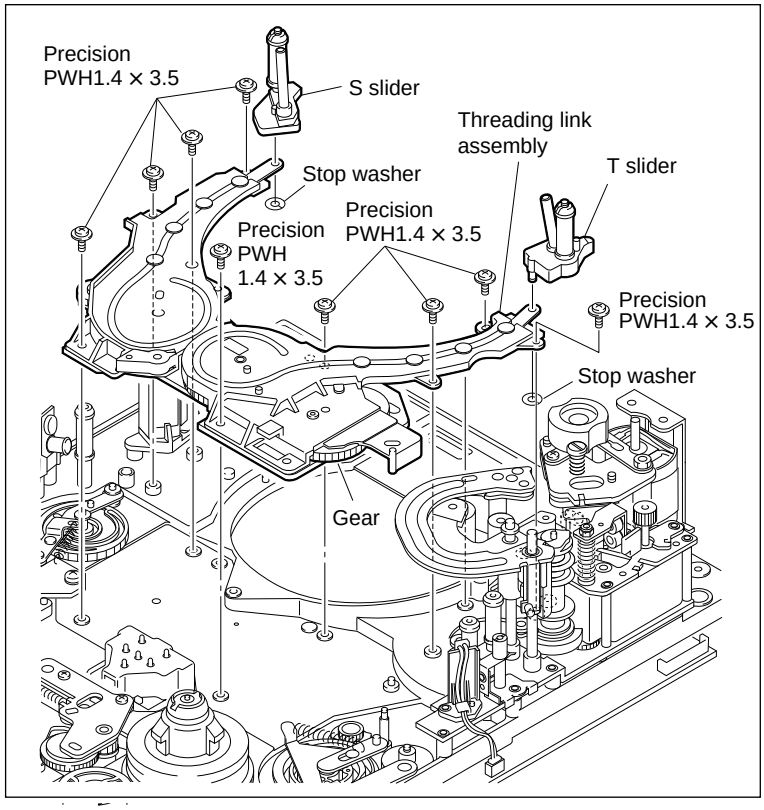

Never turn or remove this screw *
Precision PWH1.4 × 3.5
Precision PWH1.4 × 3.5
Precision PWH1.4 × 3.5
Precision PWH1.4 × 3.5
Never turn or * remove this screw
Precision PWH1.4 × 3.5
S cather
T catcher
Full top senser
Precision PWH1.4 × 3.5
PTP2.6 × 5

9. Threading link assembly removal

(1) Remove the nine precision screws shown in the figure.
(2) Remove the threading link assembly.

Note

Take care that the threading link assembly does not strike against the fixed head during removal.

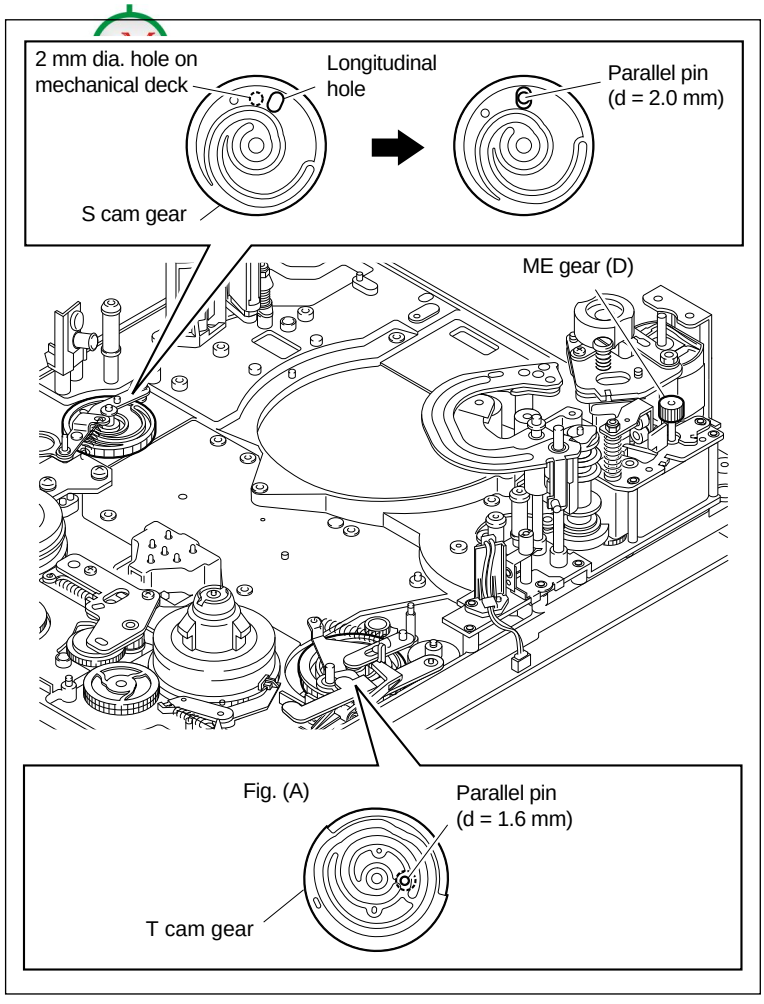


10. Slider replacement

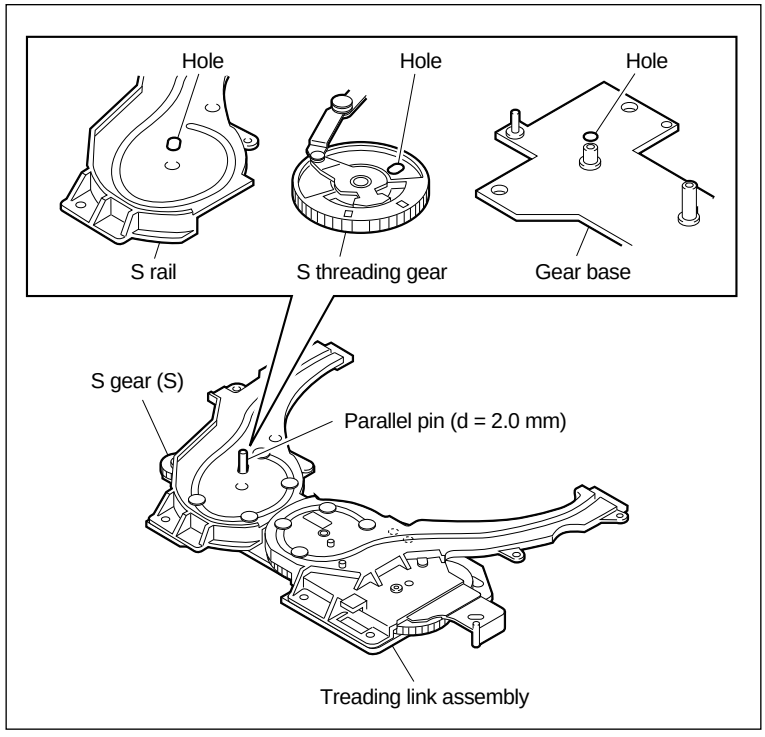
(1) Pull out the slider and remove the stop washer at the back of the slider to be replaced.
(2) Pull out the slider from the end of the rail.
(3) Install a new slider using a new stop washer.
(4) Move the slider to the former position.
(5) Confirm that the S and T sliders smoothly move when the gear shown in the figure is turned.

11. Threading link assembly installation

(1) Turn the ME gear (D) clockwise so that the T cam gear hole and mechanical deck hole are located as shown in figure (A), then pass the parallel pin (d = 1.6 mm) through these holes.
(2) Turn the S cam gear with finger to align the longitudinal hole of the S cam gear with the reference hole (2.0 mm) on the mechanical deck. Then pass the parallel pin (d = 2.0 mm) through these holes.



(3) Turn the S gear (S) of the threading link assembly aginst spring tension clockwise to coincide with three holes, the hole on the S rail shown in the figure, the hole on the S threading gear and the hole on the gear base. Then pass the parallel pin (d = 2.0 mm) through these three holes.



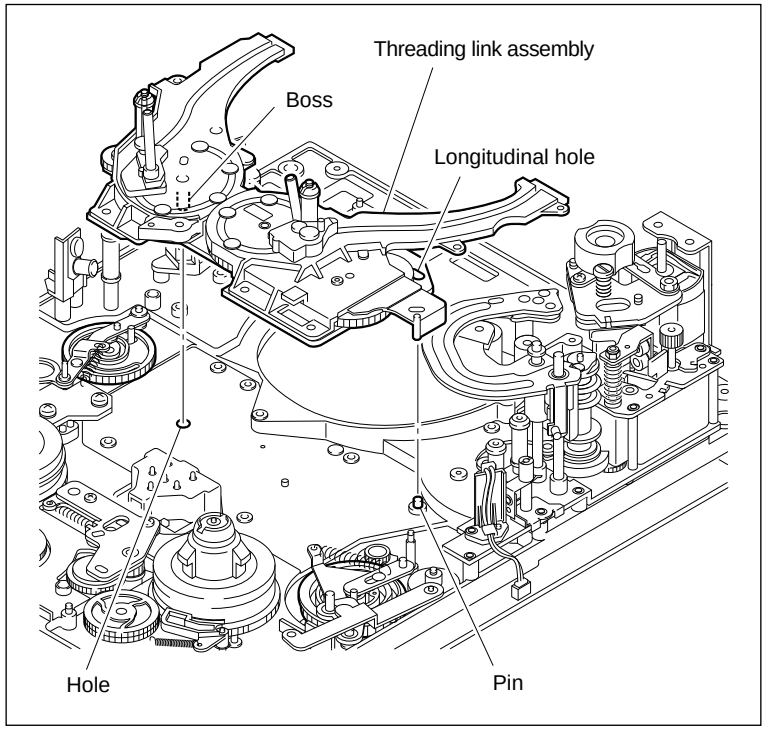
(4) While keeping the state of steps (1) to (3), install the threading link assembly so that the boss and longitudinal hole of the link assembly are put into the hole and pin on the mechanical deck.

(5) Fix the link assembly with the nine screws.

Note

Be careful not to hit the stationary head and other parts with a screwdriver during installation.

(6) Pull out three parallel pins passed in steps (1) to (3).



12. S and T catchers installation
Install the S catcher and T catcher with the three precision screws, respectively.

13. Full top sensor installation
Install the full top sensor with the screw.
(Refer to step 12 in Section 4-5.)

14. Tension regulator band installation
Install the tension regulator band.
(Refer to Section 3-9.)

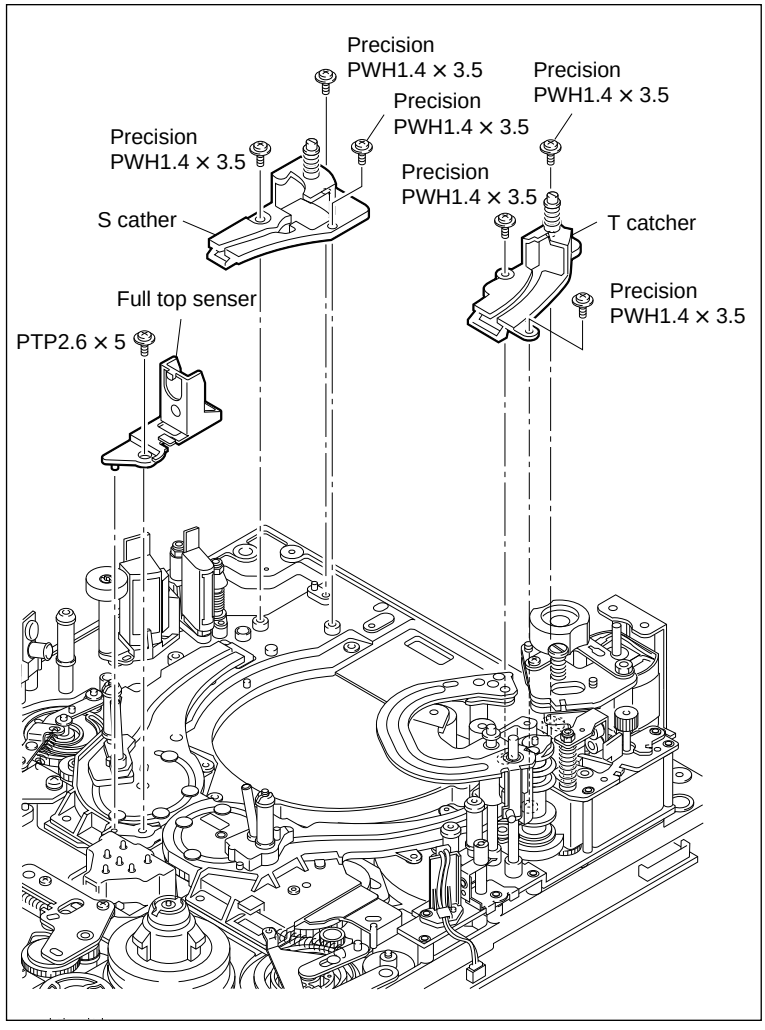
15. T tension regulator arm installation
Install the T tension regulator arm.
(Refer to Section 3-9.)

16. S tension regulator arm installation
Install the S tension regulator arm with two screws. (Refer to Section 4-10.)

17. Drum assembly installation
Install the drum assembly. (Refer to Section 3-5.)

18. Pinch arm assembly installation
Install the pinch arm assembly.
(Refer to Section 3-7.)

19. VH cleaner assembly installation
Install the VH cleaner assembly.
(Refer to Section 3-6.)



Adjustment after replacement

20. Tape running adjustment
(Refer to Section 5-4.)

21. Video tracking adjustment
(Refer to Section 5-5.)

22. CTL head position adjustment
(Refer to Section 5-7.)

23. AT head position adjustment
(Refer to Section 5-8.)

4-6. S/T Threading Gear Replacement

Outline

Replacement

VH cleaner assembly removal
Pinch arm assembly removal
Drum assembly removal
T tension regulator arm removal
Tension regulator band removal
S tension regulator arm removal
S and T catchers removal
Full top sensor removal
Threading link assembly removal
Slider removal
Threading gear assembly removal
Cleaning and oil applying
Threading gear assembly installation
Slider installation
Threading link assembly installation
S and T catchers installation
Full top sensor installation
Tension regulator band installation
T tension regulator arm installation
S tension regulator arm installation
Drum assembly installation
Pinch arm assembly installation
VH cleaner assembly installation

Adjustment after replacement

Tape running adjustment
Video tracking adjustment
CTL head position adjustment
AT head position adjustment

Precautions

- The four new stop washers and an E ring are required when replacing the S/T threading gear.
  E ring: 7-624-105-04 (2.3) × 1
  Stop washer: 3-559-408-11 × 4 (for S, T sliders, tension regulator band, and T tension arm)
- The two parallel pins (d = 2.0 mm) are required as tools for gear phase adjustment.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

Tools

- Stop washer fastening tool: J-6323-530-A
- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Parallel pin (d = 1.6 mm): 3-649-266-01
- Parallel pin (d = 2.0 mm): 3-703-358-04
- Oil: 7-661-018-18
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Replacement

1. VH cleaner assembly removal

Remove the VH cleaner assembly.
(Refer to Section 3-6.)

2. Pinch arm assembly removal

Remove the pinch arm assembly.
(Refer to Section 3-7.)

3. Drum assembly removal

Remove the drum assembly.
(Refer to Section 3-5.)

4. T tension regulator arm removal

Remove the T tension regulator arm.
(Refer to Section 3-9.)

5. Tension regulator band removal

Remove the tension regulator band.
(Refer to Section 3-9.)

6. S tension regulator arm removal

Remove the S tension regulator arm.
(Refer to Section 4-10.)

7. Full top sensor removal

Remove the full top sensor.
(Refer to step 7 in Section 4-5.)

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8. S and T catchers removal

Remove the T and S catchers.
(Refer to step 8 in Section 4-5.)

9. Threading link assembly removal

Remove the threading link assembly.
(Refer to step 9 in Section 4-5.)

10. Slider removal

Remove the slider.
(Refer to step 10 in Section 4-5.)

Note

Treat the removed slider gently and take care that the guide and roller are not damaged or deformed.

11. Threading gear assembly removal

(1) Remove the link shaft's flange of the gear assembly from the rail while expanding the rail of the threading gear assembly to be replaced.
(2) Remove the precision screw, then remove the rail and threading gear assembly from the threading gear base assembly.

12. Cleaning and oil applying

(1) Clean the installation shaft of the removed threading gear assembly with cleaning cloth moistened with cleaning fluid.
(2) Apply oil of a 1/4 drop to the cleaned shaft.

13. Threading gear assembly installation

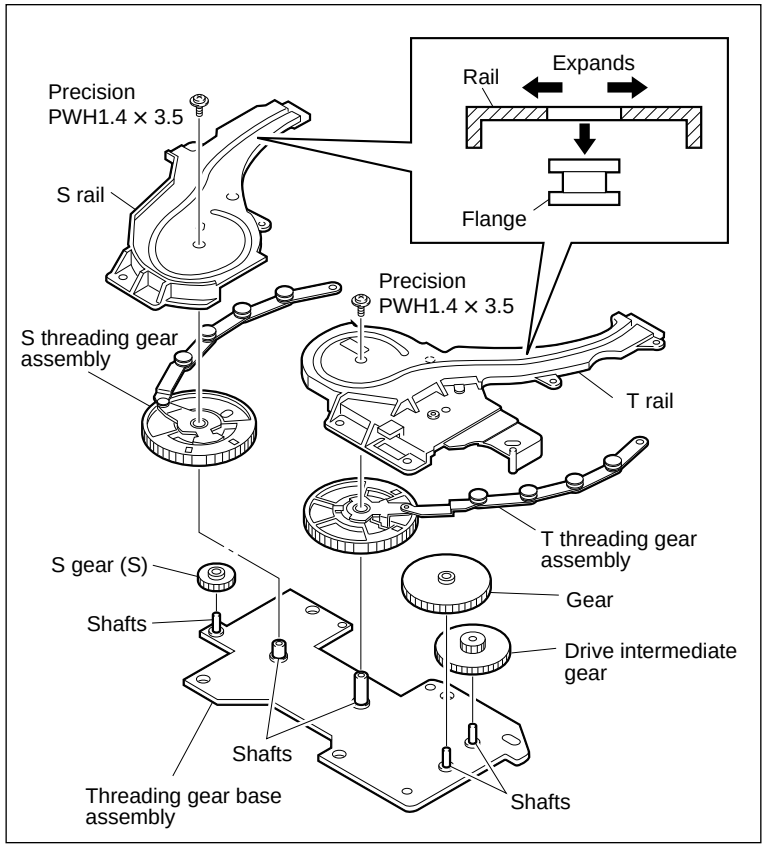
(1) Install the S gear (S), S threading gear assembly, T threading gear assembly, drive intermediate gear, and gear in the threading gear base assembly while aligning them with the mark shown in the figure.
(2) Fix the screws in the center of the S and T rails tentatively.
(3) Pass the link shaft's flanges of the S and T threading gear assemblies through the rail while expanding the rail.

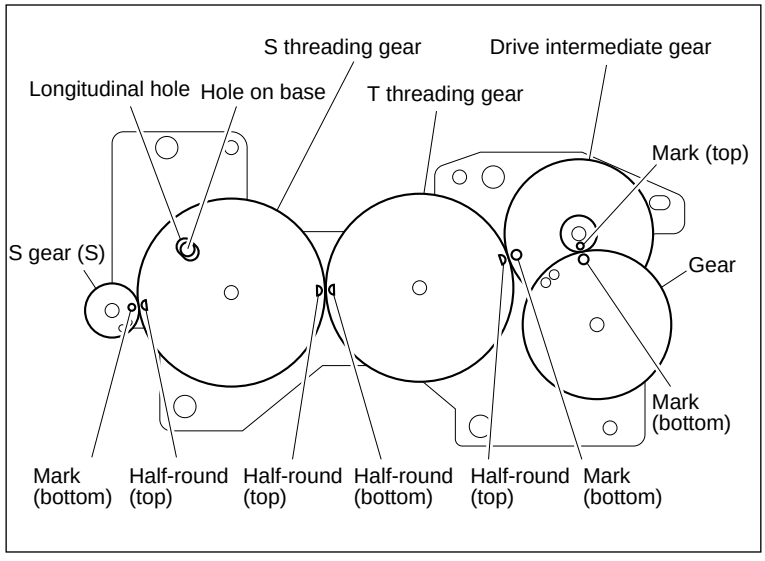
Note

Ensure that the S threading gear assembly is steady onto the threading gear base assembly. If it is unsteady, the mesh of gear wheels of the S gear (S) and S threading gear assembly is easy to be out of phase.

14. Slider installation

(1) Pull out the link of the threading gear assembly.
(2) Install the slider using a new stop washer.





15. Threading link assembly installation
Install the threading link assembly.
(Refer to step 11 in Section 4-5.)

16. Full top sensor installation
Install the full top sensor.
(Refer to step 12 in Section 4-5.)

17. S and T catchers installation
Install the T and S catchers.
(Refer to step 13 in Section 4-5.)

18. Tension regulator band installation
Install the tension regulator band.
(Refer to Section 3-9.)

19. T tension regulator arm installation
Install the T tension regulator arm.
(Refer to Section 3-9.)

20. S tension regulator arm installation
Install the S tension regulator arm with two screws. (Refer to Section 4-10.)

21. Drum assembly installation
Install the drum assembly. (Refer to Section 3-5.)

22. Pinch arm assembly installation
Install the pinch arm assembly.
(Refer to Section 3-7.)

23. VH cleaner assembly installation
Install the VH cleaner assembly.
(Refer to Section 3-6.)

Adjustment after replacement

24. Tape running adjustment
(Refer to Section 5-4.)

25. Video tracking adjustment
(Refer to Section 5-5.)

26. CTL head position adjustment
(Refer to Section 5-7.)

27. AT head position adjustment
(Refer to Section 5-8.)

4-7. Reel Table Replacement

Outline

Replacement

Tension regulator band assembly removal (when T reel table is replaced)
S main brake assembly removal (when S reel table is replaced)
Reel table removal
Reel shaft cleaning
Reel table cleaning
Reel table installation (1)
Reel table height adjustment
Reel table installation (2)
Tension regulator band assembly installation (when T reel table was replaced)
S main brake assembly installation (when S reel table was replaced)
Operation check

Adjustment after replacement

FWD back tension adjustment (when S reel table was replaced)
REV back tension adjustment (when T reel table was replaced)
Tape running adjustment

Precaution

The height of the reel table is used as the reference of a tape running system. After the reel table is replaced, be sure to perform the reel table height adjustment.

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame. (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

Note

Four polywashers are installed at the top and bottom of the reel table.
The polywashers (three 0.13 mm thickness: 3-303-961-01, one 0.25 mm thickness: 3-303-961-11) at the top of the reel table are spare ones during reel table replacement. Be careful not to lose or damage them.

Tools

- Stop washer fastening tool: J-6323-530-A
- Reel table height adjustment tool: J-6324-150-A
- Cassette reference plate: J-7032-610-B
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01
- Torque driver (3 kg): J-6325 400 A
- Bit for torque driver (M1.4): J-6325-110-A

Replacement

1. Tension regulator band assembly removal (when T reel table is replaced)

(1) Turn the manual eject knob clockwise and move the eject link to the position shown in the figure.

(2) Remove a stop washer of the tension regulator band assembly.

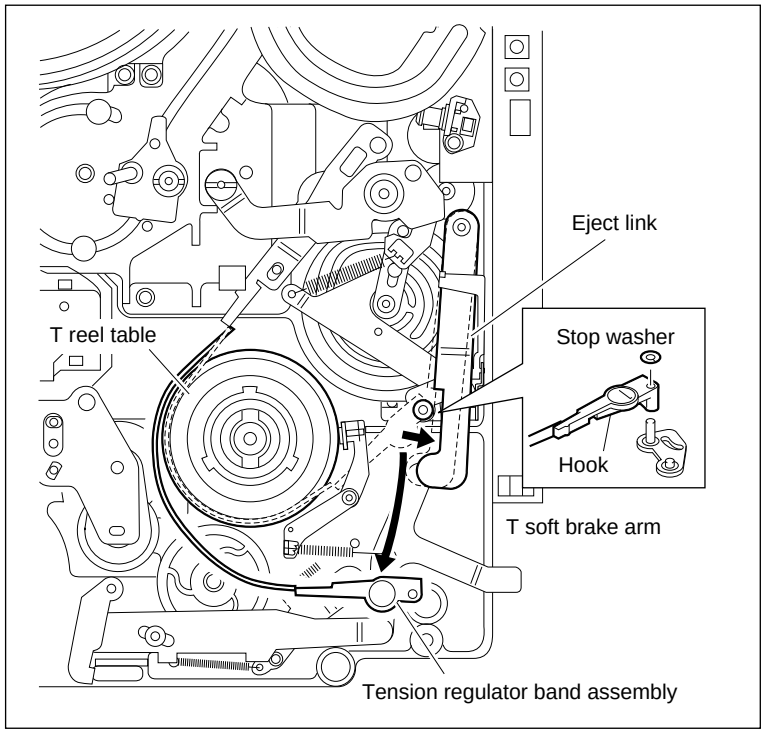
Note

Do not apply excessive force to the tension regulator arm assembly when the stop washer is removed.

(3) Remove the hook of the tension regulator band assembly from the mechanical deck.

Note

Do not touch the felt surface of the tension regulator band assembly with fingers. Do not bend the tension regulator band assembly or make oil adhere to the felt surface.



2. S main brake assembly removal (when S reel table is replaced)

Remove the S main brake assembly.
(Refer to Section 3-12.)

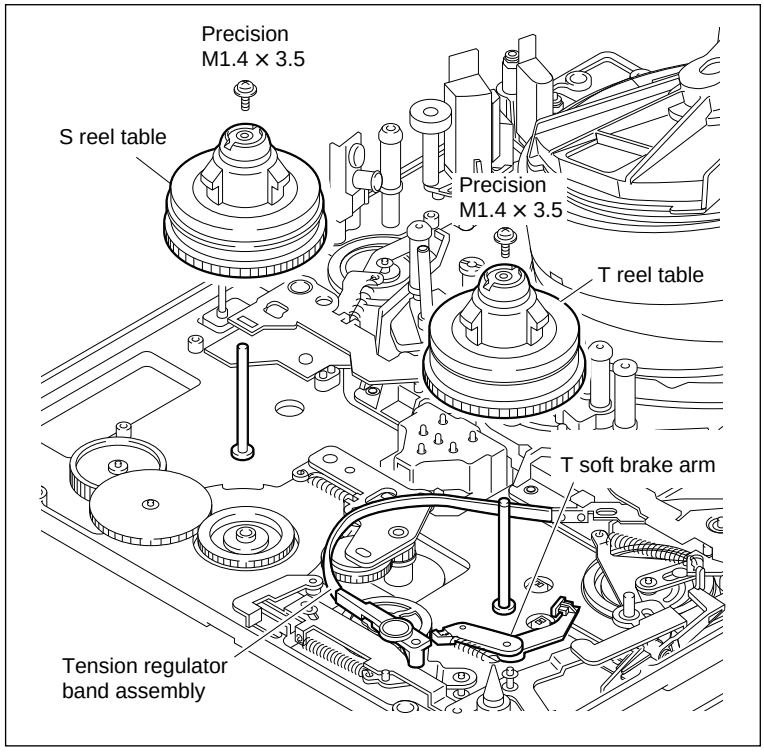
3. Reel table removal

(1) Remove the precision screw on the top of the reel table.

(2) Pull out the reel table while releasing the tension regulator band assembly and T soft brake arm or S main brake, which interfere with the reel table, with finger.

Note

Polywashers may adhere to the bottom of the reel table. Return all polywashers to the reel shaft in this case.



4. Reel shaft cleaning

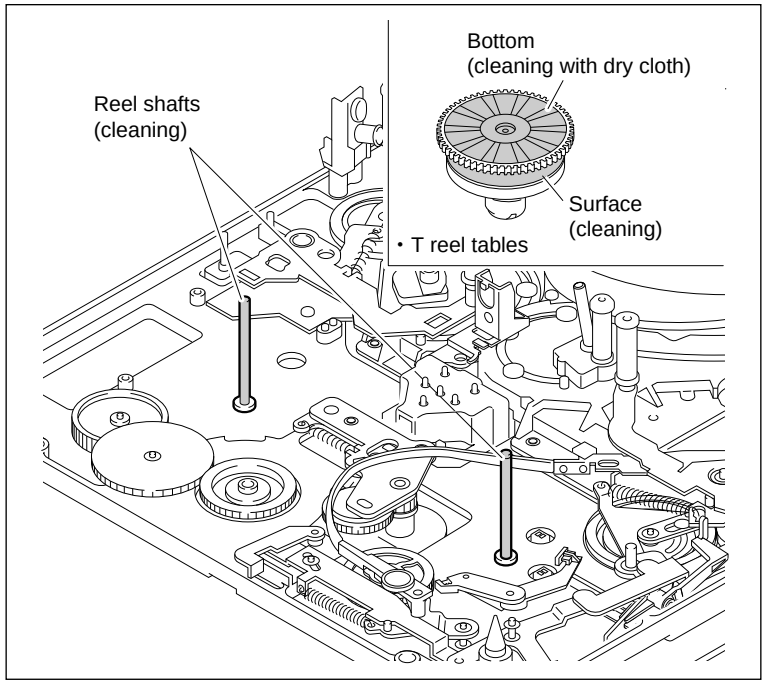
Clean the reel shaft with cleaning cloth moistened with cleaning fluid.

5. Reel table cleaning

(1) Clean the surface of the reel table, that the tension regulator band or S main brake touch, with cleaning cloth moistened with cleaning fluid.
(2) Wipe the bottom of the T reel table with dry cloth.

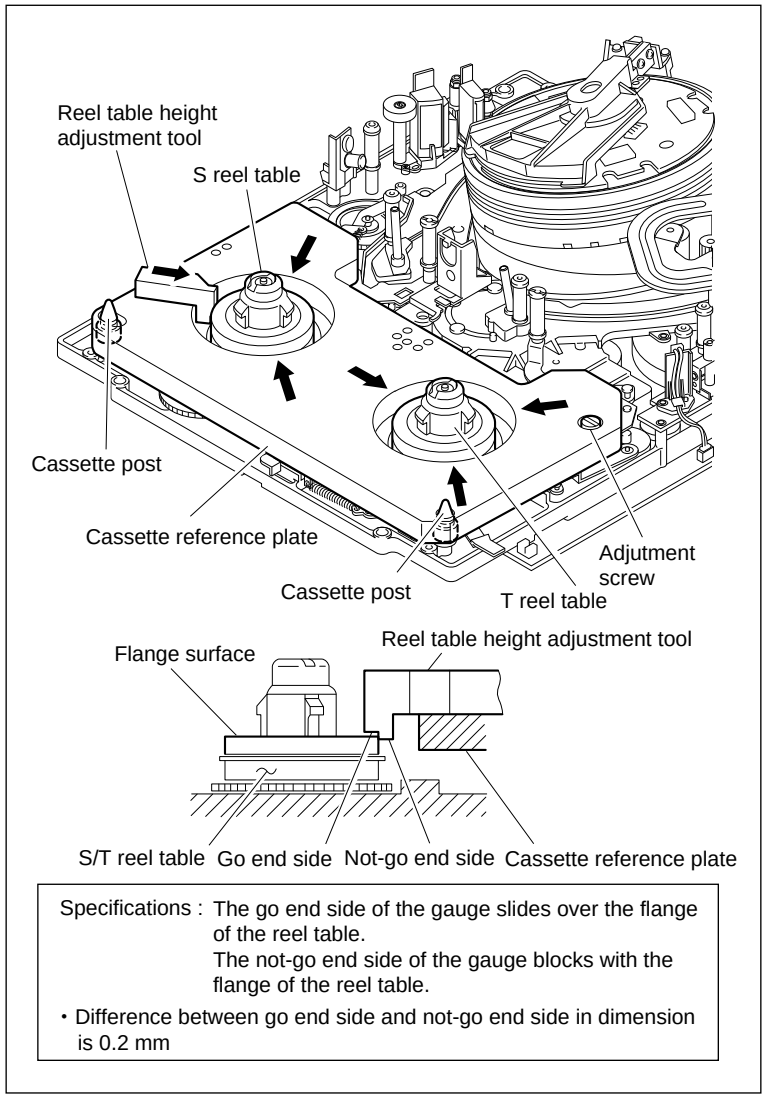
6. Reel table installation (1)

Install the reel table to the reel shaft while releasing the tension regulator band assembly and T soft brake arm or S main brake with finger.



7. Reel table height adjustment

(1) Place the cassette reference plate on the two cassette posts, then install it as shown in the figure.
Turn the adjustment screw of the cassette reference plate and adjust so that no play exists between the cassette reference plate and posts.
(2) Move the reel table height adjustment tool to the flange surface of the S and T reel tables at intervals of 120 degrees shown in the figure, and check that the specifications are satisfied. If the specifications are not satisfied, adjust according to step (3).
(3) Increase or decrease the number of polywashers under the reel table for adjustment.
When the reel table height is lower than the specifications;
Insert the polywashers at the top of the reel table into the bottom of the reel table.
When the reel table height is higher than the specifications;
Insert the polywashers at the bottom of the reel table into the top of the reel table.
Reconfirm the specifications.



Specifications : The go end side of the gauge slides over the flange of the reel table.
The not-go end side of the gauge blocks with the flange of the reel table.

• Difference between go end side and not-go end side in dimension is 0.2 mm

8. Reel table installation (2)

(1) Secure the reel table using the precision screw.
(2) Move the reel table vertically and confirm that the play exists.

9. Tension regulator band assembly installation (when T reel table was replaced)

Install the hook of the tension regulator band assembly removed in step 1 to the shaft on the band adjustment bracket, and then fasten it using a new stop washer.

Note

Be careful not to bend or damage the tension regulator band assembly during installation.

10. S main brake assembly installation (when S reel table was replaced)

Install the S main brake assembly.
(Refer to Section 3-12.)

11. Operation check

(1) Put the unit into the unthreading end state.
(2) Rotate the reel table while releasing the T soft brake or S main brake with finger and check that the reel table and idler rotate smoothly.

Adjustment after replacement

12. FWD back tension adjustment (when S reel table was replaced)

(Refer to Section 5-3-1.)

13. REV back tension adjustment (when T reel table was replaced)

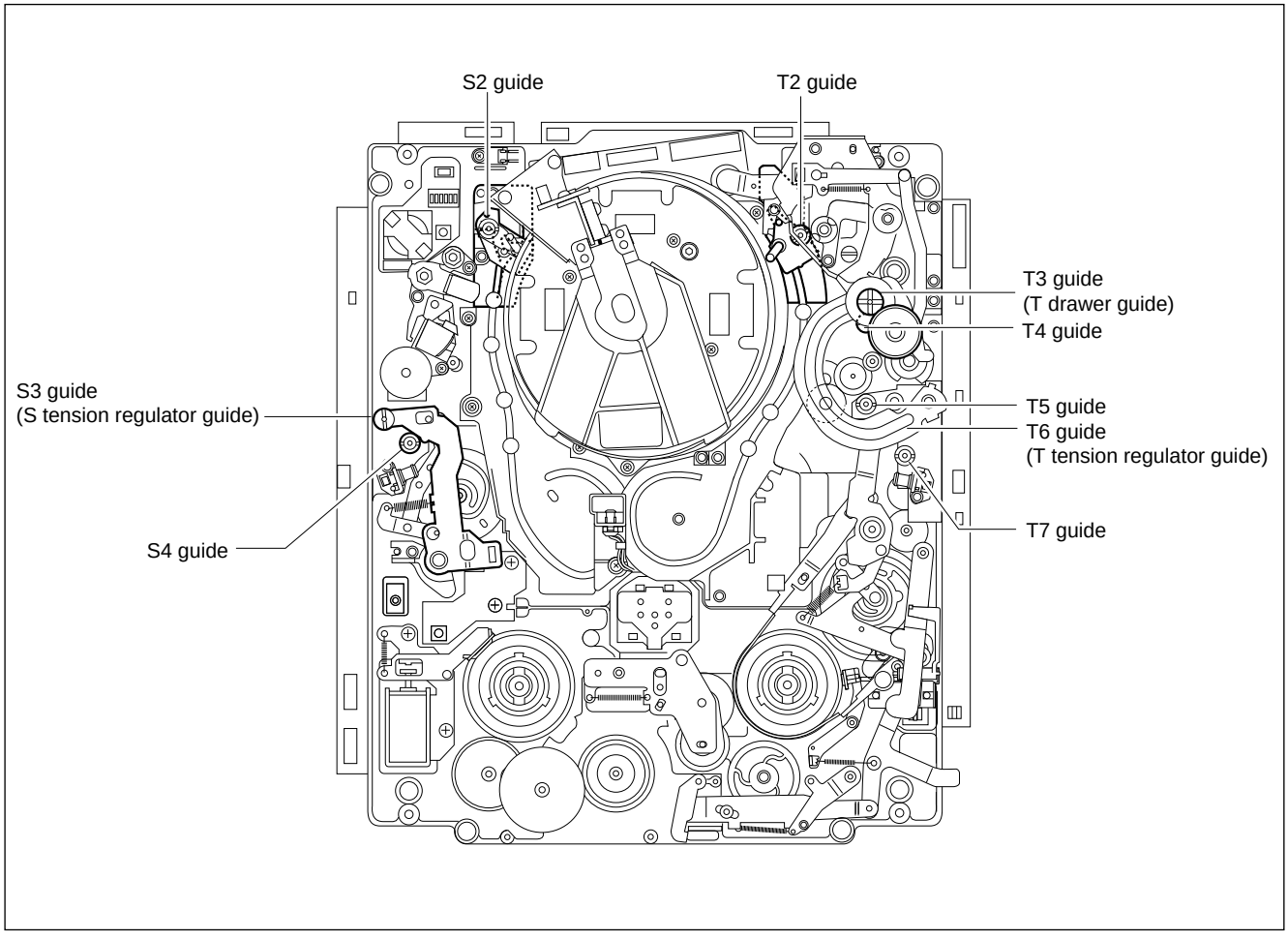
(Refer to Section 5-3-2.)

14. Tape running adjustment

(Refer to Section 5-4.)

4-8. Tape Guide Replacement

The replacement procedures of the following tape guides are described in this section.



Outline

Replacement

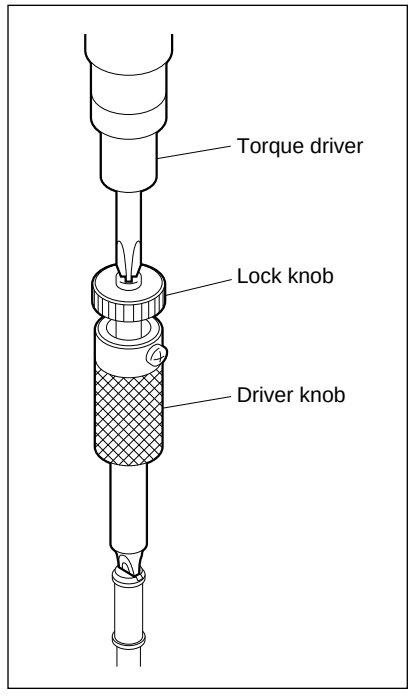
Tape guide removal
Tape guide installation

Adjustment after replacement

Tape guide height tentative adjustment
Tape running adjustment

Precautions

- Even though the multiple tape guides replacement are necessary, replace the tape guide one by one. And perform the tape running adjustment after each tape guide replacement is completed.
  If the multiple tape guides are replaced at the same time, it is very difficult to perform the tape running adjustment. Then, do not perform the multiple tape guides replacement at the same time.
- Tighten the setscrew at the top of the tape guide with the following tightening torque.
  9×10^{-2} N•m (0.9 kgf•cm)
  How to tighten the setscrew with specified tightening torque:
  Set the torque screwdriver to the specified tightening torque.
  Set the torque screwdriver tip to the philips type screw on top of the tape guide adjustment driver as shown in the figure, and then tighten the setscrew using the torque screwdriver.



Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Tools

- Tape guide adjustment driver (45): J-6322-420-A
- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Note

If the tape guide adjustment driver tip is broken, it is recommended to repair by using the following spare bit.

- Spare bit (0.89 mm): J-6322-420-3

Replacement

1. Tape guide removal

Note

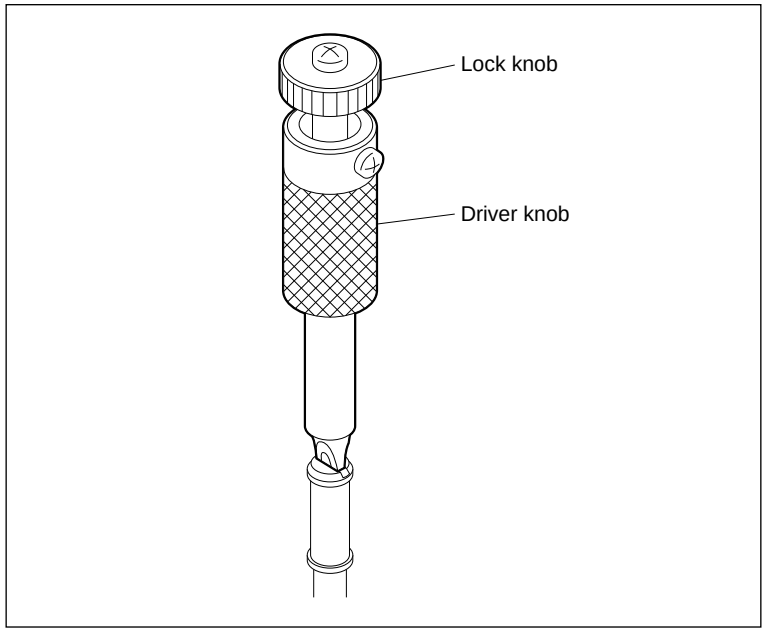
When replacing the T3 tape guide (T drawer guide), remove the pinch arm assembly first. (Refer to Section 3-7.)

(1) Set the tape guide adjustment driver on top of the upper flange as shown in the figure.
(2) Loosen the setscrew by turning the driver knob counterclockwise a slightly amount.

Note

It is too difficult to perform the height adjustment for S3 guide (S tension regulator guide), T3 guide (T drawer guide), and T6 guide (T tension regulator guide), then do not loosen the set screw for these guides. For another tape guides, when the tape guide roller is only replaced, it is recommended to loosen the set screw a slightly amount, then the height adjustment can easily performed.

(3) Turn the driver knob counterclockwise, then remove the upper flange from the tape guide shaft.
(4) Pull out the guide roller from the shaft. The lower flange and compression spring can be removed.



2. Tape guide installation

(1) Pass the compression spring through the guide shaft.

(2) Pass the lower flange through the guide shaft.

(3) Pass the guide roller through the guide shaft.

Notes

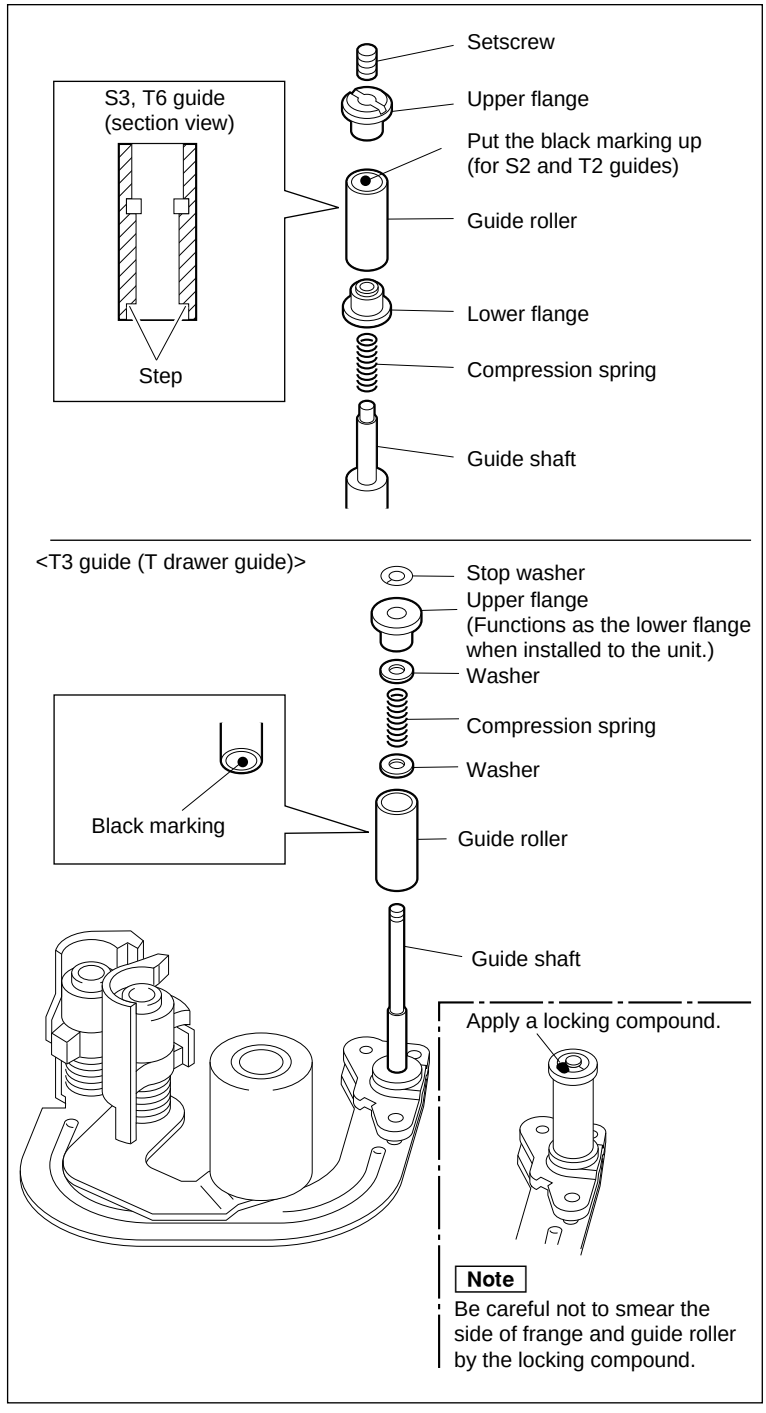
- For S2 and T2 guide rollers:
  Put the black marking on the guide roller up as shown in the figure.
- For S3 and T6 guide rollers:
  Put the step inside the guide roller down as shown in the figure.
- For T3 guide roller:
  Put the black marking on the guide roller down as shown in the figure.

(4) Screw the setscrew to the upper flange.

Note

It is not necessary to perform this step when the upper flange and setscrew are re-used.

(5) Turn the upper flange clockwise, and thread it to the guide shaft.



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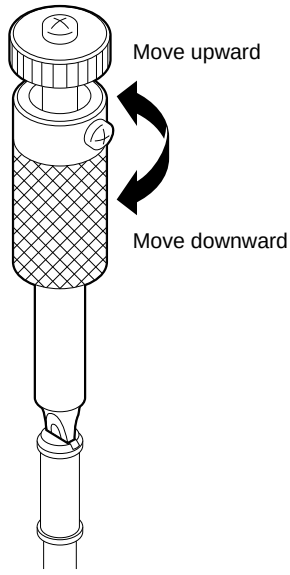
Adjustment after replacement

3. Tape guide height tentative adjustment

(1) Turn on the power.
(2) Insert the commercially available cassette tape to the unit, and put the unit into PLAY state at the beginning portion of the tape.
(3) Adjust the replaced tape guide height using the tape guide adjustment driver to meet the specifications.
(4) Tighten the setscrew with specified tightening torque.
(Tightening torque: 9×10^{-2} N•m {0.9 kgf•cm})



4. Tape running adjustment

(Refer to Section 5-4.)

Specifications:

- S2 guide
  Tape runs in contact with the upper flange.
- S3 guide (S tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If the tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- S4 guide
  Tape should run without contacting the upper and lower flanges.
- T2 guide
  Tape runs in contact with the upper flange.
- T3 guide (T drawer guide)
  Tape runs in contact with the lower flange.
  If tape curl occurs, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T4 and T5 guides
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.
- T6 guide (T tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T7 guide
  Tape should run without contacting the upper and lower flanges.
  Even if the tape runs without contacting this tape guide roller, it is acceptable.

4-9. Pinch Press Cam Replacement

Outline

Replacement

Pinch arm assembly removal
VH cleaner assembly removal
Pinch press cam removal
Pinch press cam installation/phase adjustment
Pinch press cam fixing
VH cleaner assembly installation
Pinch arm assembly installation

Check after replacement

Operation check

Precaution

- The following new stop washer and E ring are required when replacing the pinch press cam.
  Stop washer: 3-559-408-11
  E ring: 7-624-105-04

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

Tools

- Stop washer fastening tool: J-6323-530-A
- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Parallel pin (d = 1.6 mm): 3-649-266-01
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01
- Grease (PG-662): 7-651-000-59
- Tweezers

Replacement

1. Pinch arm assembly removal

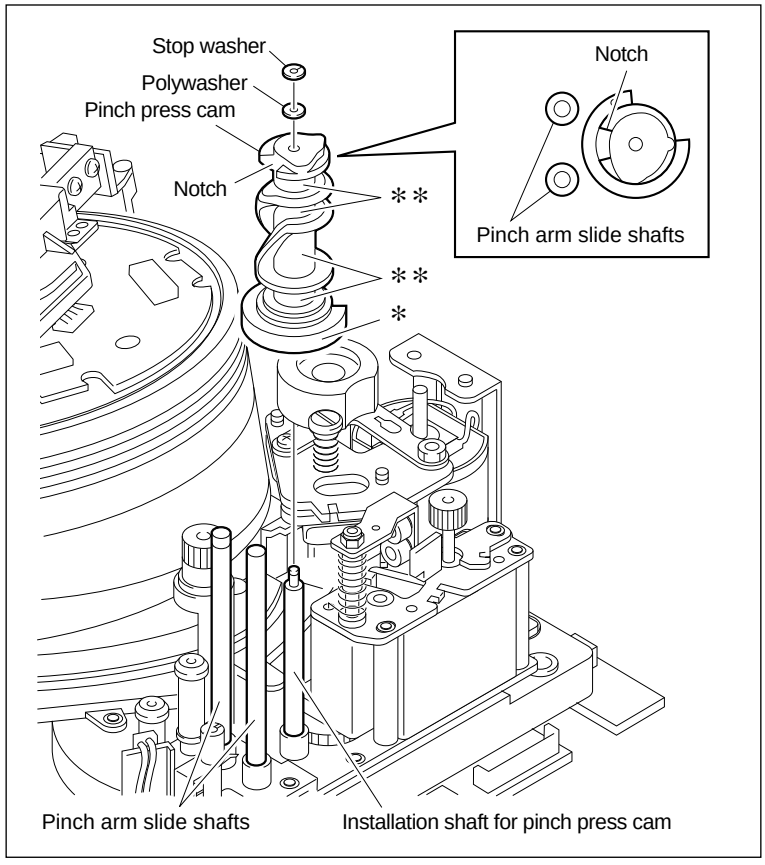
Remove the pinch arm assembly.
(Refer to Section 3-7.)

2. VH cleaner assembly removal

Remove the VH cleaner assembly.
(Refer to Section 3-6.)

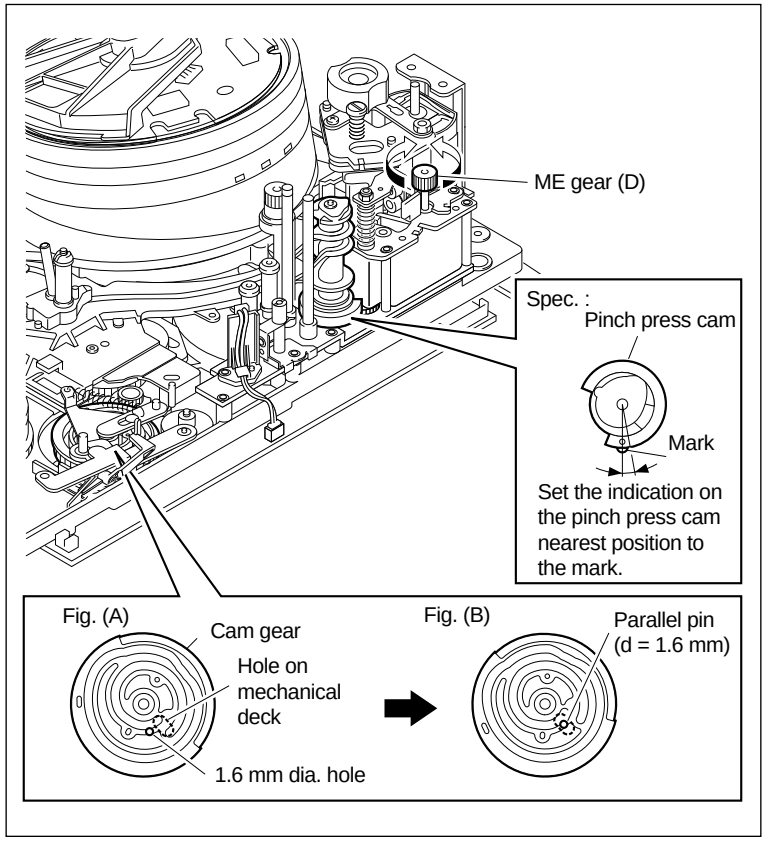
3. Pinch press cam removal

(1) Remove the stop washer using tweezers, then remove the pinch press cam.
(2) Clean the installation shaft of the pinch press cam with cleaning cloth moistened with cleaning fluid.
(3) Apply grease of two grains in the size of 3 mm dia. to the ∗-marked portion of a new pinch press cam shown in the figure. Similarly, apply grease of five grains to the whole circumference of the ∗∗-marked cam groove.
(4) Install the pinch press cam in the shaft while facing the notch of the pinch press cam in the direction shown in the figure.



4. Pinch press cam installation/phase adjustment

(1) Turn the ME gear(D) on the gear box clockwise and adjust so that the positioning hole (1.6 mm) of the S cam gear and the reference hole of the mechanical deck are located as shown in figure (A).
(2) Turn the ME gear(D) counterclockwise so that the cam gear hole and mechanical deck hole are located as shown in figure (B), then pass a parallel pin (d = 1.6 mm) through these holes.
(3) Turn the ME gear(D) more counterclockwise with the parallel pin inserted.
Confirm that the mark of the pinch press cam and the mark of the drawer base bracket satisfy the specifications when the cam gear operation stops. If the specifications are not satisfied, lift the pinch press cam slightly up and shift the engagement of each tooth.
(4) Pull out the parallel pin (d = 1.6 mm).



5. Pinch press cam fixing

Install a polywasher washer in the shaft at the top of the pinch press cam, and then fix them with a new stop washer.

6. VH cleaner assembly installation

Install the VH cleaner assembly.
(Refer to Section 3-6.)

7. Pinch arm assembly installation

Install the pinch arm assembly.
(Refer to Section 3-7.)

Check after replacement

8. Operation check

(1) Check that the pinch arm is smoothly moved downward and pressed against the capstan shaft when the manual eject knob is turned clockwise while pushing down.
(2) Check that the pinch arm is smoothly moved upward and put into the unthreading end state when the manual eject knob is turned counterclockwise.

4-10. S Tension Regulator Arm Assembly Replacement

Outline

Replacement

S tension regulator arm assembly removal
S tension regulator arm assembly installation
S tension regulator guide cleaning

Adjustment after replacement

S tension regulator offset/gain adjustment
Tape running adjustment

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section1-7.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01

Replacement

1. S tension regulator arm assembly removal

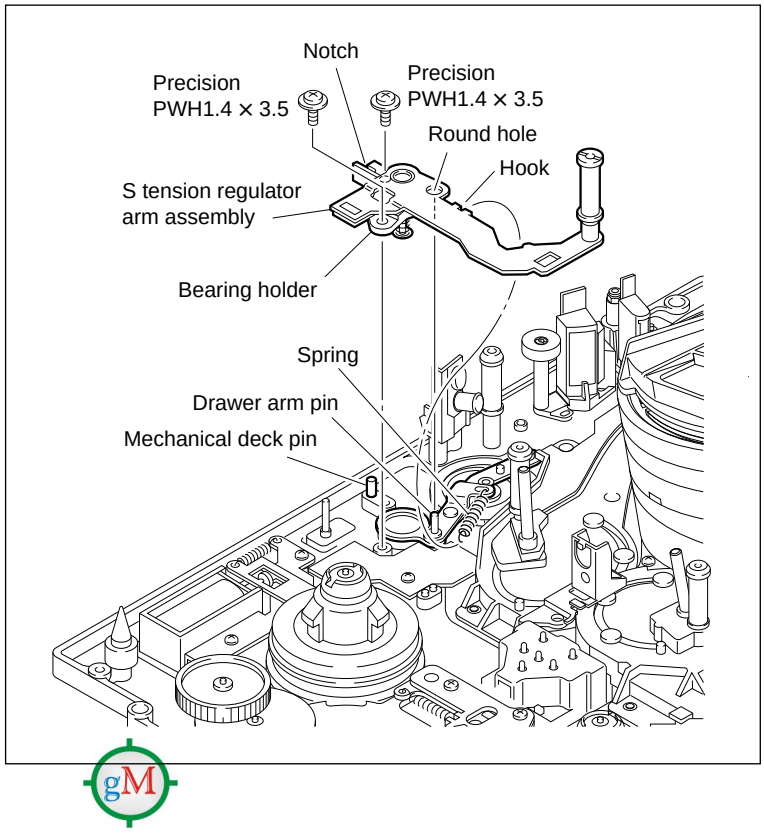
(1) Unhook the spring from the S tension regulator arm shown in the figure.
(2) Remove the two precision screws fixing the bearing holder, then remove the S tension regulator arm assembly.

2. S tension regulator arm assembly installation

(1) Align the large round hole of the drawer arm with the round hole of the mechanical deck.
(2) Set the S tension regulator arm assembly on the mechanical deck so that the drawer arm pin is put into the round hole and the mechanical deck pin is put in the notch of the bearing holder, then install it with the two precision screws.
(3) Hook the spring removed in step 1.

3. S tension regulator guide cleaning

(1) Clean the guide roller of the S tension regulator arm assembly with cleaning cloth moistened with cleaning fluid.
(2) After cleaning, wipe with dry cloth.



Adjustment after replacement

4. S tension regulator offset/gain adjustment

(Refer to Section 5-2.)

5. Tape running adjustment

(Refer to Section 5-4.)

4-11. T Tension Regulator Arm Assembly Replacement

Outline

Replacement

T tension regulator arm assembly removal
T tension regulator arm assembly installation
T tension regulator guide cleaning

Adjustment after replacement

REV back tension adjustment
Tape running adjustment

Precaution

- The following new stop washer is required when replacing the T tension regulator arm assembly.
  Stop washer: 3-559-408-11

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

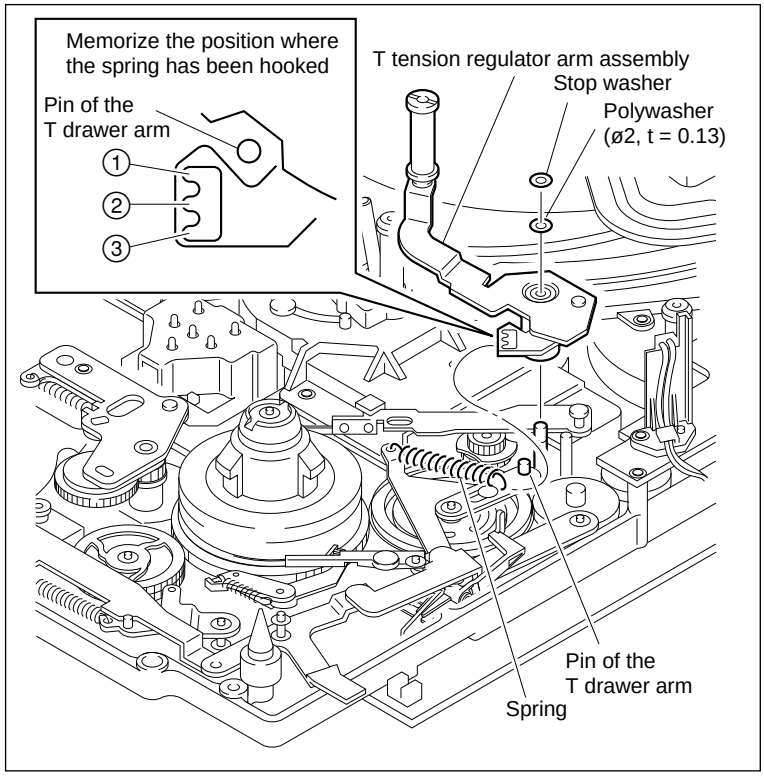
Tools

- Stop washer fastening tool: J-6323-530-A
- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01
- Tweezers

Replacement

1. T tension regulator arm assembly removal

(1) Unhook the spring of the tension regulator arm shown in the figure.
At that time, do not forget the position where the spring has been hooked.
(2) Remove the stop washer and polywasher using tweezers, then remove the T tension regulator arm assembly.



2. T tension regulator arm assembly installation

(1) Insert a new T tension regulator arm assembly into the shaft so that the pin of the T drawer arm is put between the spring hook plate and regulator arm of the T tension regulator arm assembly, and then install a new stop washer and a polywasher.
(2) Hook the spring removed in (1) of step 1 in the former position.

3. T tension regulator guide cleaning

(1) Clean the guide roller of the tension regulator arm assembly with cleaning cloth moistened with cleaning fluid.
(2) After cleaning, wipe with dry cloth.

Adjustment after replacement

4. REV back tension adjustment

(Refer to Section 5-3-2.)

5. Tape running adjustment

(Refer to Section 5-4.)

4-12. T Idler Assembly Replacement

Outline

Replacement

Spring removal
Eject link assembly/release arm assembly removal
T idler assembly removal
T idler assembly installation
Eject link assembly/release arm assembly installation
Spring installation

Check after replacement

Operation check

Precaution

- The following new stop washer is required when replacing the T idler assembly.
  Stop washer: 3-559-408-11 (4 pcs)

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

Tools

- Stop washer fastening tool: J-6323-530-A
- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Oil: 7-661-018-18
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01
- Tweezers

Replacement

1. Spring removal

Unhook the two springs of the gear connecting arm assembly side shown in the figure.

2. Eject link assembly/release arm assembly removal

Remove the two stop washers fastening the eject link assembly and one stop washer fastening the release arm assembly using tweezers, then remove the eject link and release arm assemblies from the mechanical deck.

3. T idler assembly removal

Remove the stop washer using tweezers, then remove the T idler assembly.

Note

Do not remove the polywasher (0.25 thickness : 3-303-961-11) at the bottom of the T idler assembly.

4. T idler assembly installation

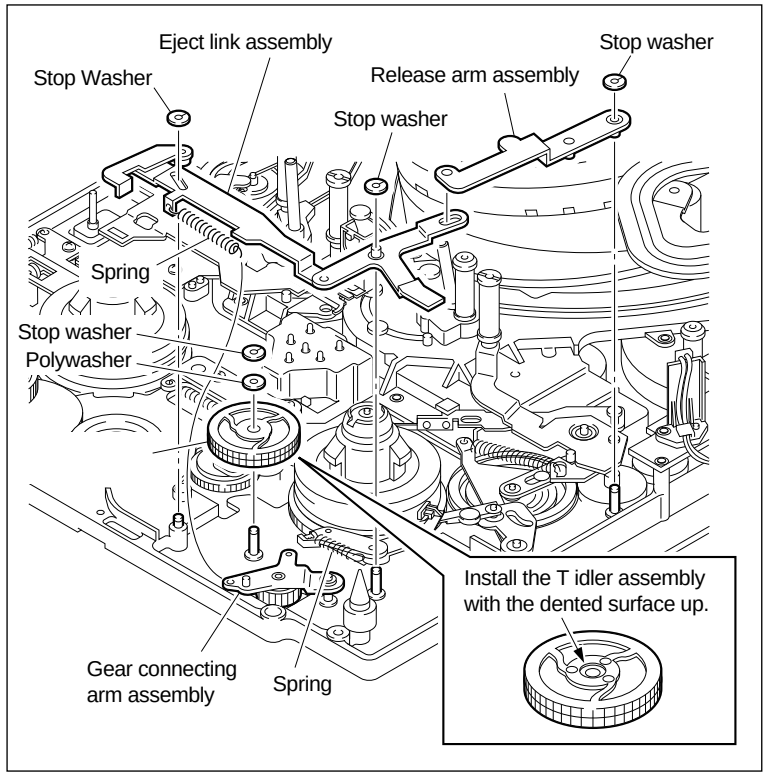
(1) Clean the installation shaft with cleaning cloth moistened with cleaning fluid.
(2) Apply a 1/4 drop of oil to the installation shaft.
(3) Install a new T idler assembly in the shaft with the dented surface shown in the figure up.
(4) Install the polywasher (0.13 thickness : 3-303-961-01).
(5) Install a new stop washer.

5. Eject link assembly/release arm assembly installation

Install the eject link and release arm assemblies using three new stop washers.

6. Spring installation

Hook the two springs removed in step 1 to the gear connecting arm assembly.



Check after replacement

7. Operation check

Insert the cassette tape and check that the PLAY, F-FWD, and REW operations are normal.

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4-13. Cam Gear Assembly Replacement

Outline

Replacement

S cam gear positioning
T tension regulator arm assembly removal
Tension regulator band removal
Release arm assembly removal
T tension drawer arm assembly removal
Cam gear assembly removal
Cam gear assembly installation
T tension drawer arm assembly installation
Release arm assembly installation
Tension regulator band installation
T tension regulator arm assembly installation
Parallel pin removal

Adjustment after replacement

Tape running check
REV back tension check

Precaution

The new stop washers (six pieces) are required when replacing the cam gear assembly.
Stop washer: 3-559-408-11

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the Maintenance Manual Part 1, Section 1-6.)
4. Remove the cassette compartment
   (Refer to the Maintenance Manual Part 1, Section 1-7.)

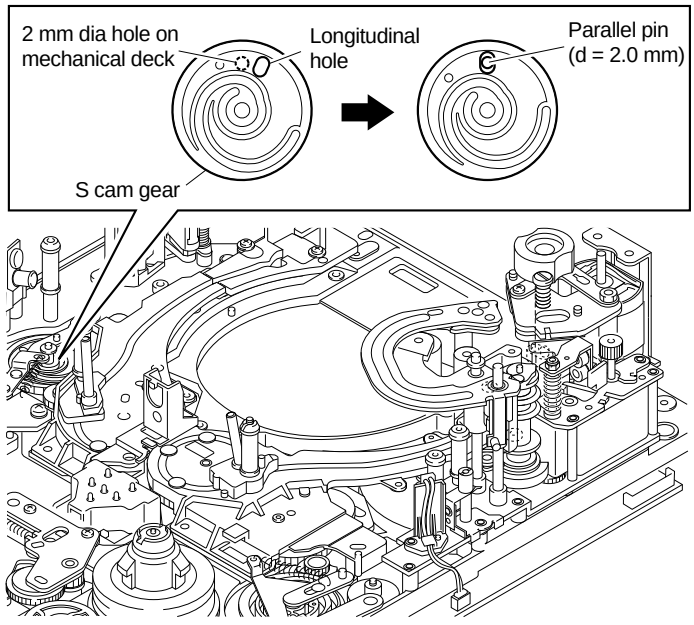
Tools

- Torque screw driver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Stop washer fastening tool: J-6323-530-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Oil: 7-661-018-18
- Grease (RG-662): 7-651-000-59
- Tweezers

Removal

1. S cam gear positioning

Turn the S cam gear with finger to align the longitudinal hole of the S cam gear with the reference hole (2.0 mm) on the mechanical deck. And then pass the parallel pin (d = 2.0 mm) through these holes.



2. T tension regulator arm removal

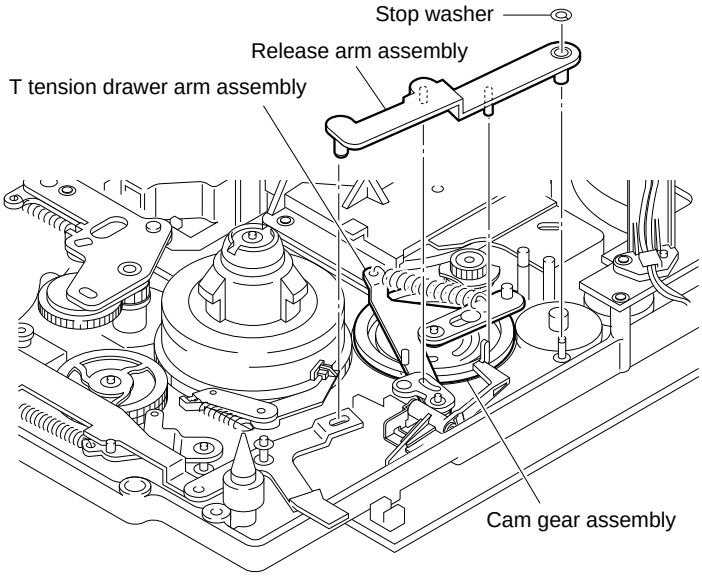
Remove the T tension regulator arm.
(Refer to Section 3-9.)

3. Tension regulator band removal

Remove the tension regulator band.
(Refer to Section 3-9.)

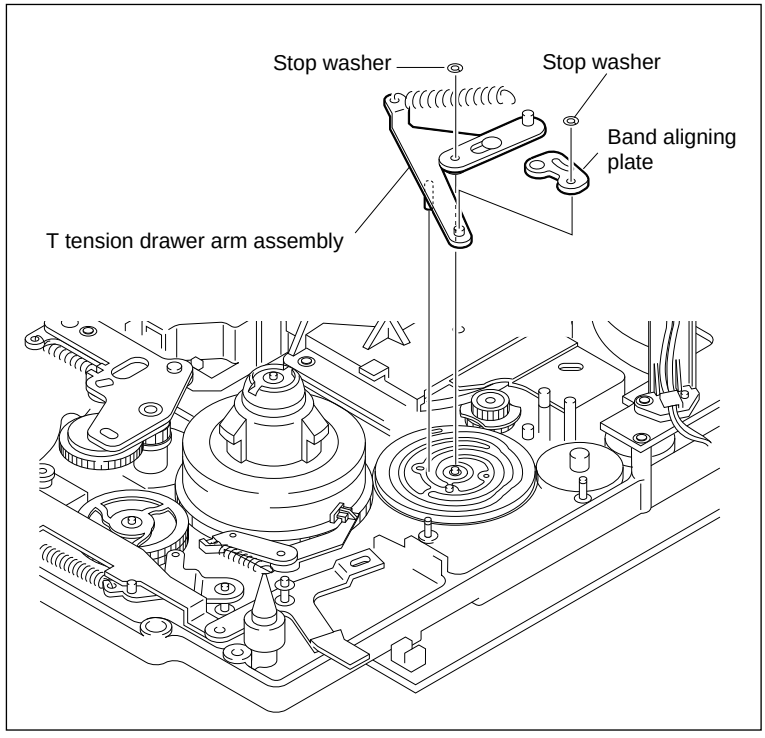
4. Release arm assembly removal

Remove the stop washer, and then remove the release arm assembly.



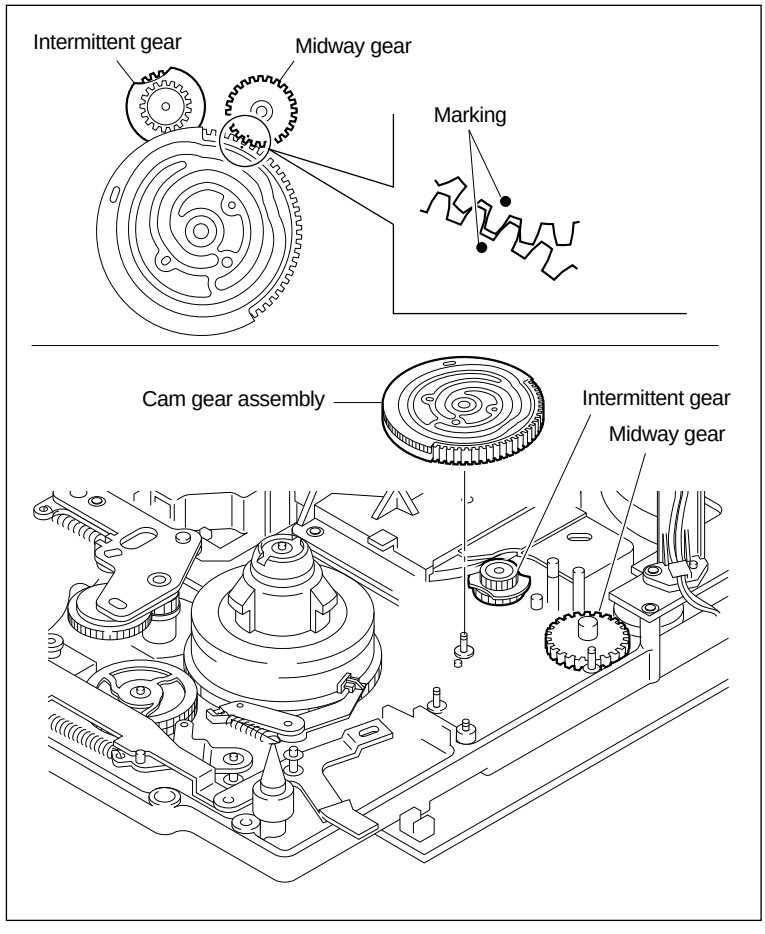
5. T tension drawer arm assembly removal

(1) Remove the stop washer, and then remove the band aligning plate.
(2) Remove the stop washer, and then remove the T tension drawer arm assembly.



6. Cam gear assembly removal

(1) Mark either of the tooth of the cam gear assembly and the tooth of the midway gear which are meshed each other, using a tweezers.
(2) Lift the cam gear assembly out.



Installation

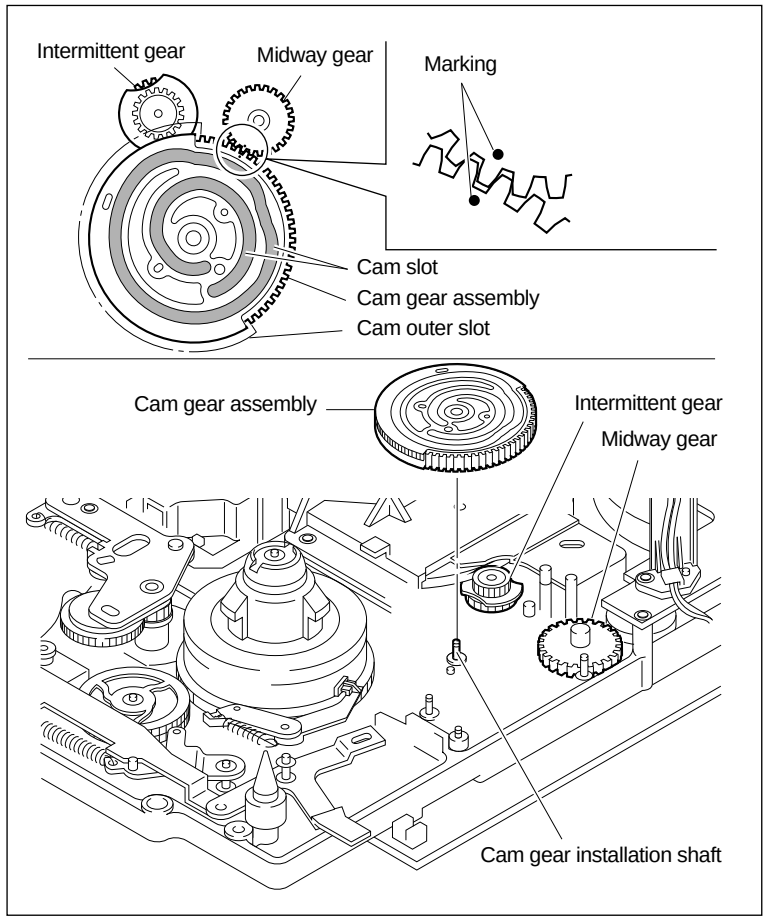
7. Cam gear assembly installation

(1) Apply one-quarter of a drop of oil to the shaft of cam gear assembly.
(2) Mark the tooth of a new cam gear assembly in the same position as the marked position of the removed cam gear assembly.
(3) Peel off the protective seal on the reflective seal surface of the new cam gear assembly. And then clean the peeled-off portion of the reflector with a cleaning fluid.

Note

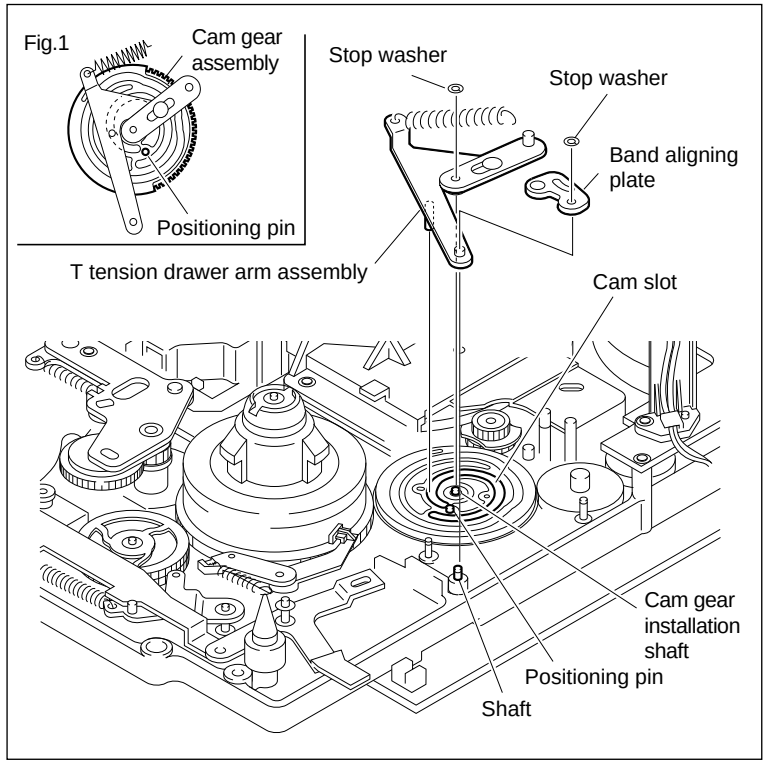
Be careful not to contact and damage the reflective seal surface.

(4) Apply a light coating of grease to the rim of cam gear assembly as shown in the figure.
(5) Attach the cam gear assembly while lining up the mark of the cam gear assembly with the mark of the midway gear.



8. T tension drawer arm assembly installation

(1) Fit the T tension drawer arm assembly onto the cam gear installation shaft, cam slot, and pin of the chassis. And then secure the T tension drawer arm assembly using a new stop washer as shown in the Fig-1.
(2) Attach the band aligning plate using a new stop washer.

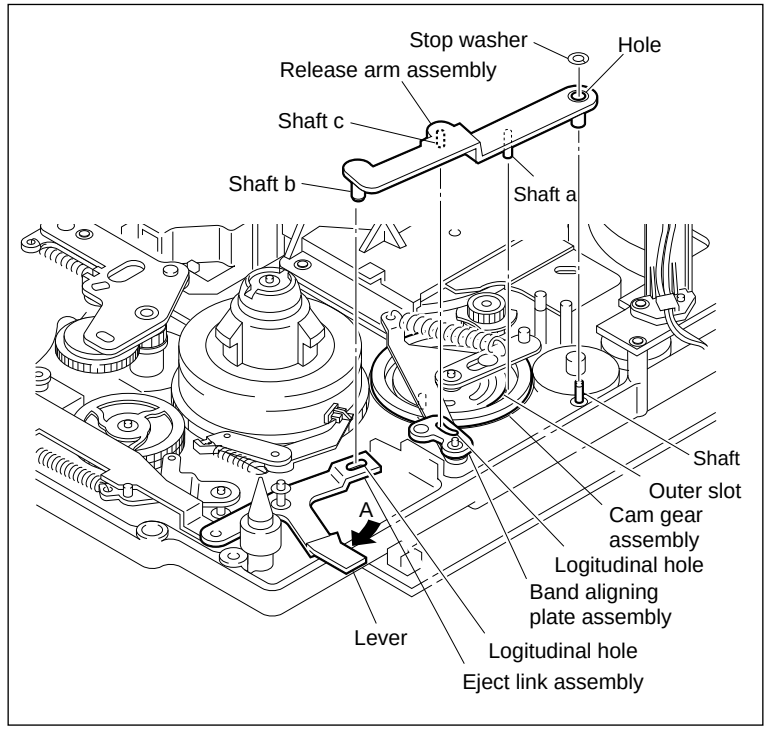


9. Release arm assembly installation

Align the hole and shafts a, b, and c with the pin, outer slot of cam gear, longitudinal hole of the eject link assembly, and the longitudinal hole of the band aligning plate. And then, secure the release arm assembly with a stop washer.

Note

Pull the lever in the direction of the arrow A to align and insert the shaft b into the longitudinal hole of the eject link assembly.



10. Tension regulator band installation

Secure the tension regulator band using a new stop washer.
(Refer to Section 3-9-3.)

11. T tension regulator arm assembly installation

Secure the T tension regulator arm assembly using a new stop washer.
(Refer to Section 3-9-4.)

12. Parallel pin removal

Pull the parallel pin out from the S cam gear.

Adjustment after replacement

13. Tape running check

(Refer to Section 5-4.)

14. REV back tension check

(Refer to Section 5-3-2.)

4-14. Intermittent Gear Replacement

Outline

Replacement

Threading link assembly removal
Cam gear assembly removal
Intermittent gear replacement
Cam gear assembly installation
Threading link assembly installation

Adjustment after replacement

Tape running check
REV back tension check

Precaution

The following new stop washer is required when replacing the intermittent gear.
Stop washer: 3-559-408-11

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment
   (Refer to the maintenance manual Part 1, Section 1-7.)

Tools

- Torque screw driver bit (for M2): J-6325-380-A
- Torque screwdriver (for 3 kg): J-6325-400-A
- Stop washer fastening tool: J-6323-530-A
- Parallel pin (d = 2.0 mm): 3-703-358-04
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning fluid: 9-919-573-01
- Oil: 7-661-018-18
- Grease (RG-662): 7-651-000-59
- Tweezers

Removal

1. Threading link assembly removal

Remove the threading link assembly.
(Refer to Section 4-5-9.)

2. Cam gear assembly removal

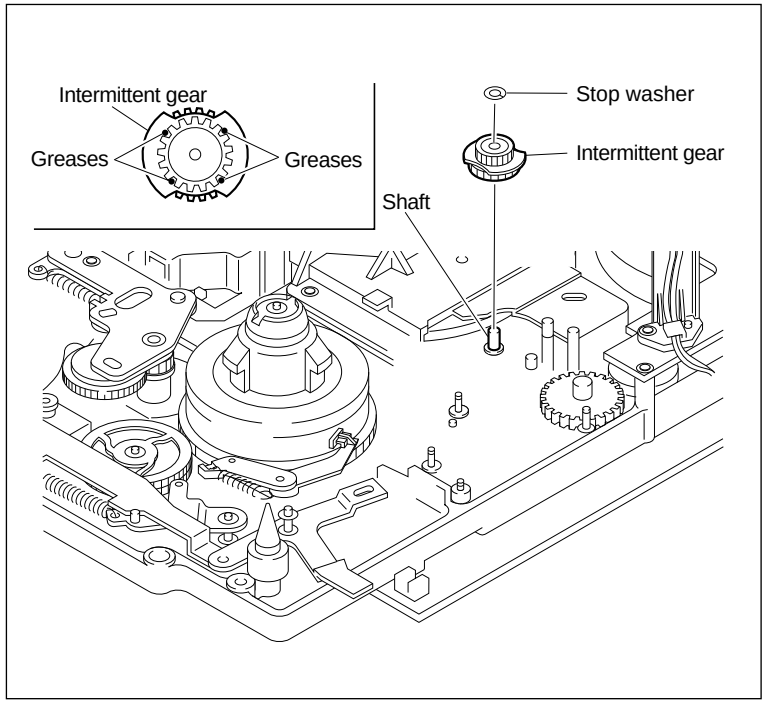
Remove the cam gear assembly.
(Refer to Section 4-13.)

Note

Mark either of the tooth of the cam gear assembly and the tooth of the midway gear which are meshed each other, using a tweezers.

3. Intermittent gear replacement

(1) Remove the stop washer to remove the intermittent gear.
(2) Apply one-quarter of a drop of oil to the shaft of intermittent gear.
(3) Apply a rice-grain-sized amount of grease to each of the four points on the upper and lower part of the new intermittent gear.
(4) Secure the intermittent gear using a new stop washer.

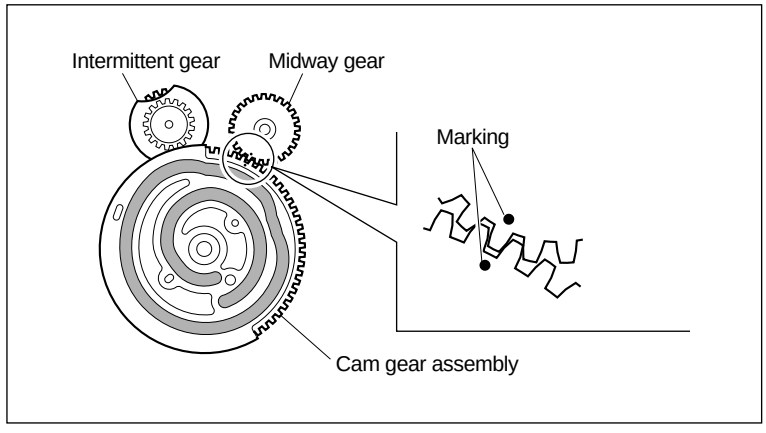


4. Cam gear assembly installation

Reattach the cam gear assembly.
(Refer to Section 4-13-7.)
Aligning the cam gear assembly to either notch of the intermittent gear, reattach the cam gear assembly.

5. Threading link assembly installation

Reattach the cam gear assembly.
(Refer to Section 4-5-11.)



Adjustment after replacement

6. Tape running check

(Refer to Section 5-4.)

7. REV back tension check

(Refer to Section 5-3-2.)

4-15. Fan Motor Replacement

WARNING

If the fan motor is out of order, the inside temperature of the unit will rise. Touching the inside in this state may cause a burn. When replacing the fan motor, perform the replacement after powering off until the inside cools off.

Outline

Replacement

Fan motor removal
Fan motor Installation
Connector panel installation
Operation check

Preparations

1. Turn off the power.
2. Open the connector panel.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M2): J-6325-380-A

Replacement

1. Fan motor removal

(1) Remove the two screws, then remove the fan bracket.
(2) Disconnect the harness connector of the fan motor connected to CN3 on the CP-317 board, then remove the fan motor.

2. Fan motor installation

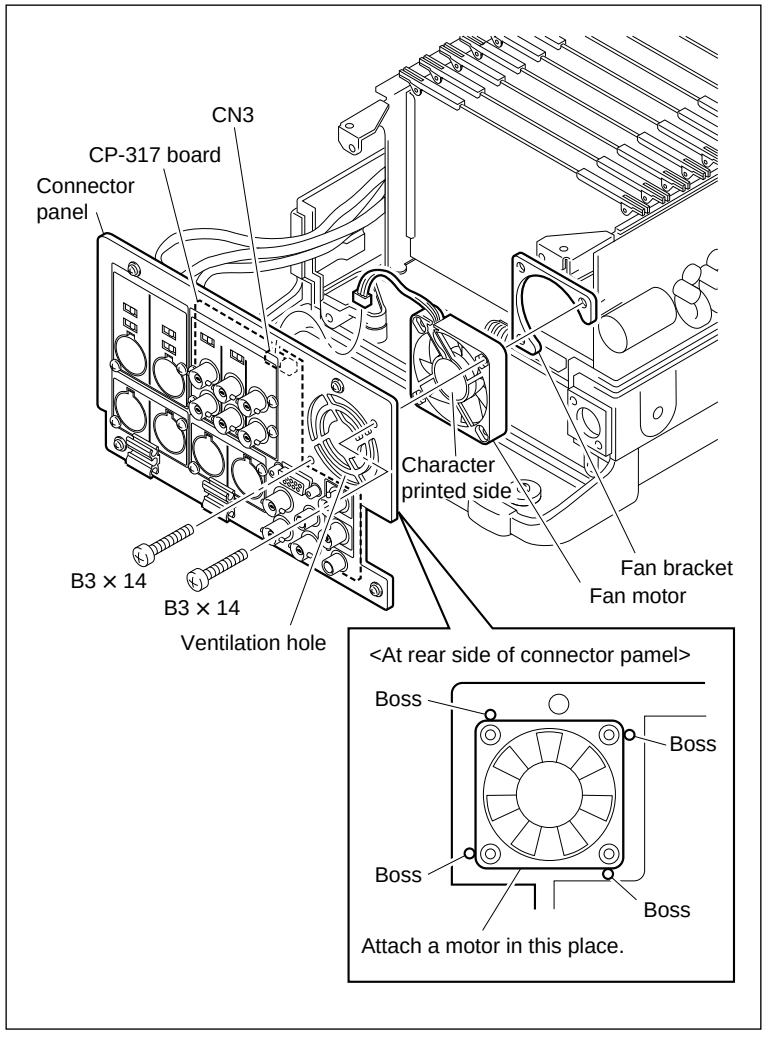
(1) Wipe off dust on the ventilation hole with a soft cloth or equivalent.
(2) Place a new fan motor on the rear panel positioing as shown in the figure. Ensure that the outer surfaces of the fan motor contact with four bosses on the panel as shown.
(3) Fit the motor bracket to the fan motor as shown in the figure, and tighten them with two screws.
(4) Connect the harness connector of the fan motor to CN3 on the CP-317 board.

3. Connector panel installation

Install the connector panel to the unit.
(Refer to the maintenance manual Part 1, Section 1-6.)

4. Operation check

(1) Turn on the power.
(2) Check that the fan motor rotates, and blows off the air from the ventilation hole of the unit.



4-16. JOG/SHUTTLE Dial Replacement

Outline

Replacement

JOG/SHUTTLE dial removal
JOG/SHUTTLE dial installation

Preparations

1. Turn off the power.
2. Remove the control panel. (Refer to Section 3-1-7.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A

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Replacement

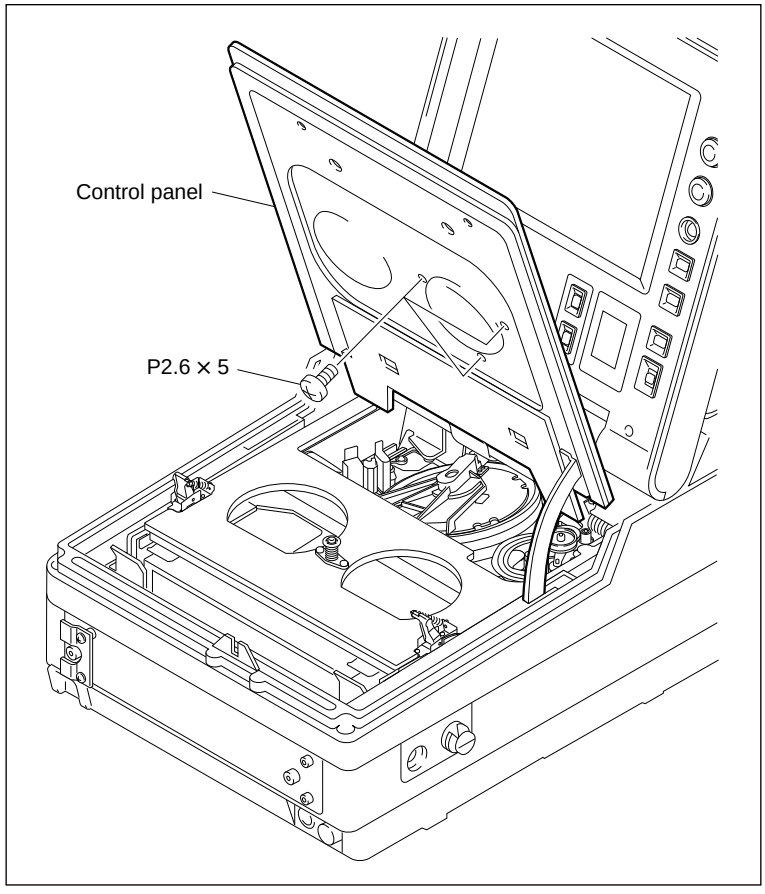
1. JOG/SHUTTLE dial removal

(1) Remove the three screws from the back side of the control panel as shown in the figure.

(2) Disconnect the harness connector connected to the JOG/SHUTTLE dial, then remove the JOG/SHUTTLE dial.

Note

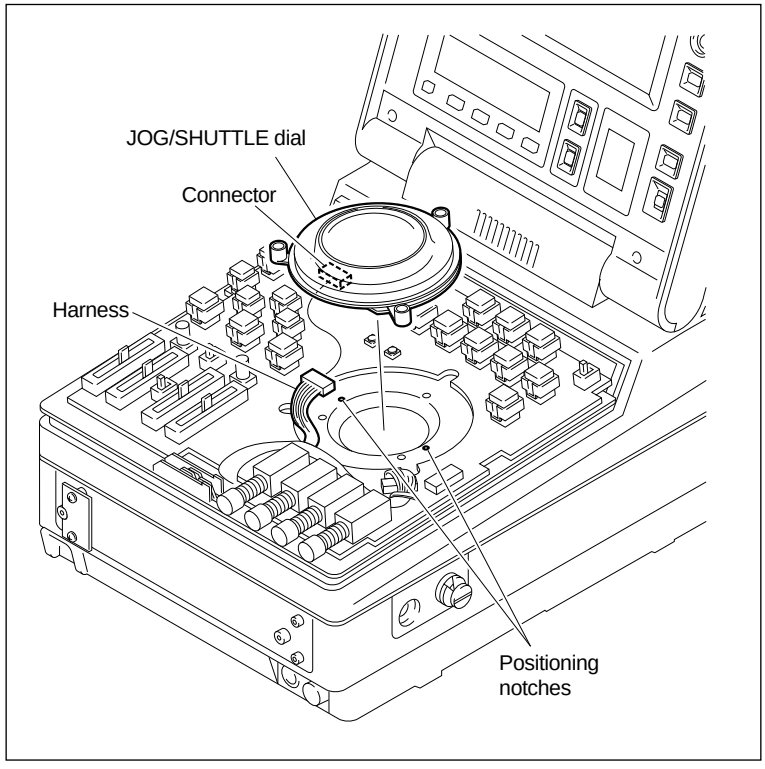
Tthe harness is very short. In the case that it hard to work, pull out the harness from beneath the KY board until it is caught.
Do not pull it excessively.
Connect the harness to a new JOG/SHUTTLE dial, and push the harness in beneath the KY board.



2. JOG/SHUTTLE dial installation

(1) Connect the harness connector disconnected in (2) of step 1 to a new JOG/SHUTTLE dial.

(2) Fit the three bosses of the JOG/SHUTTLE dial to the three positioning notches on the back side of the control panel, then tighten it with three screws.
(Tightening torque: 20×10^{-2} N•m
{2.0 kgf•cm})



4-17. LCD Monitor and Backlight Replacement

4-17-1. Backlight Replacement

Outline

Replacement

DP-300 board removal
Backlights removal
Backlights installation
DP-300 board installation

Precaution

The two backlights are located on the top and bottom at the back side of the LCD monitor. If either top or bottom of the backlight is turned off because of it reaches at the end of its useful life, it is recommended to replace both backlights at the same time.

Preparations

1. Turn off the power.
2. Remove the display panel cover. (Refer to Section 3-1-6.)

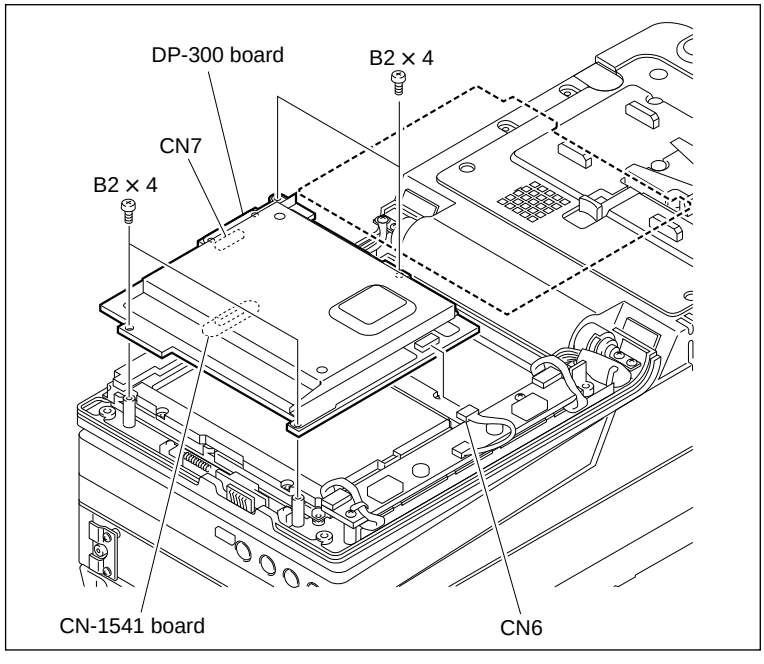
Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A

Replacement

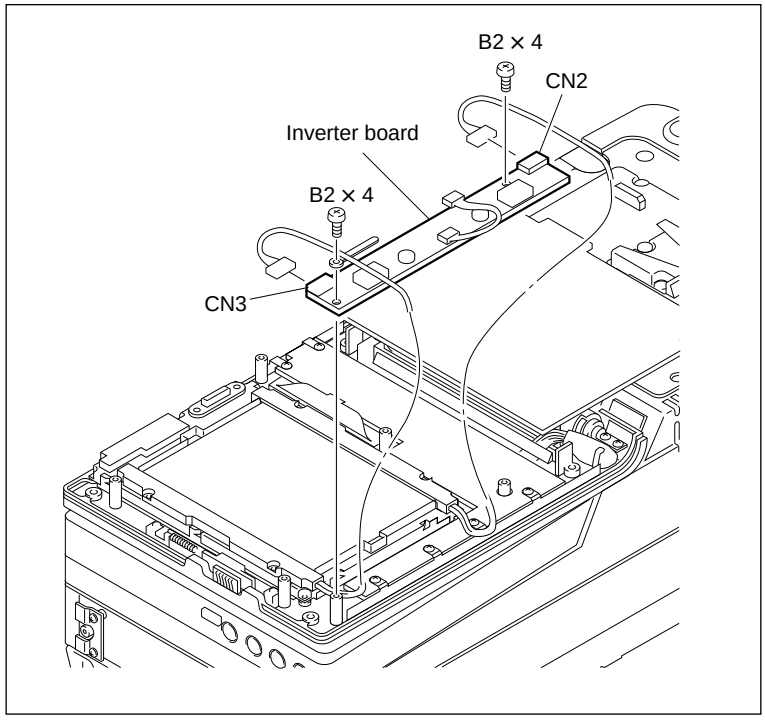
1. DP-300 board removal

(1) Disconnect the harness connector connected to CN6 on the DP-300 board.
(2) Remove the four screws shown in the figure.
(3) Disconnect the connector CN7 connected to the CN-1541 board below the DP-300 board to lift the DP-300 board out.

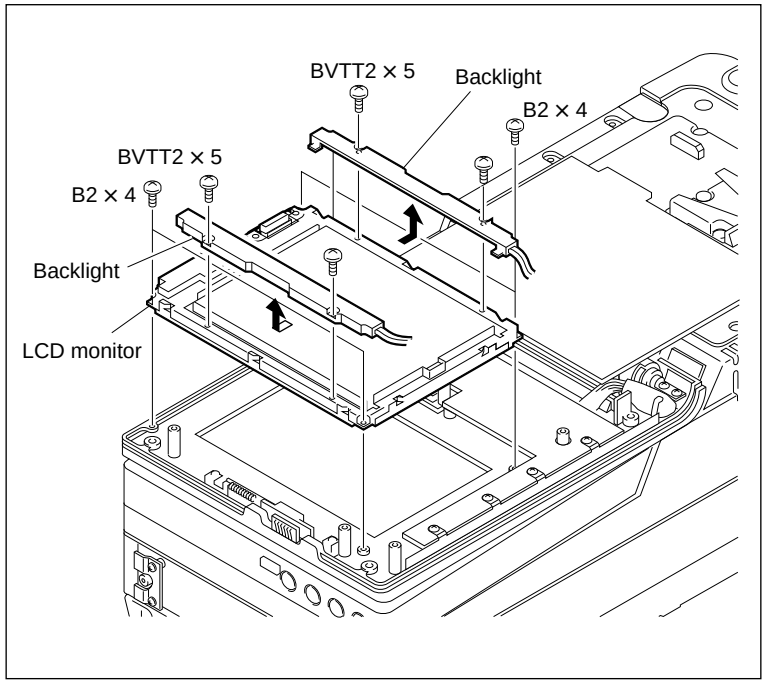


2. Backlights removal

(1) Remove the two screws, then remove the inverter board.
(2) Disconnect the two harness connectors of the backlights connected to CN2 and CN3 on the inverter board.

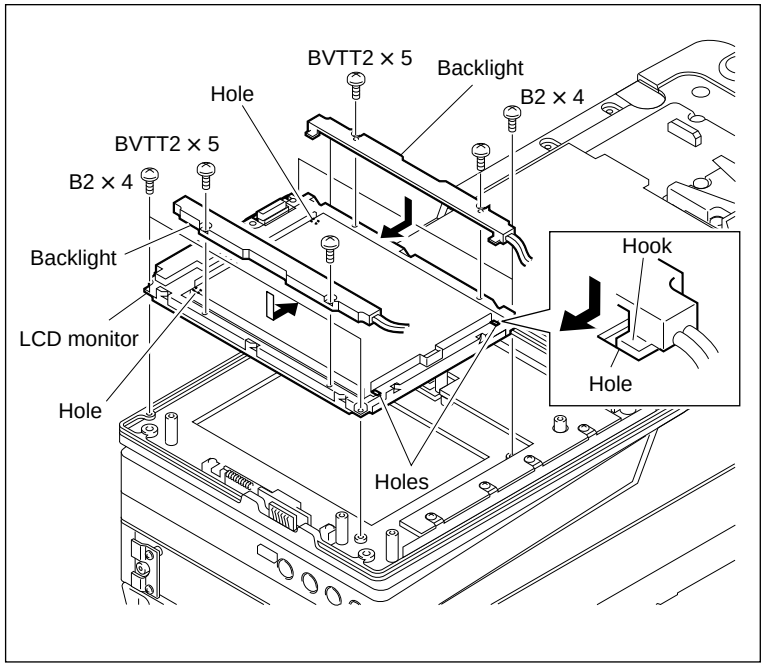


(3) Remove the four screws to remove the LCD monitor.
(4) Remove the four screws, then remove the backlights by moving it in the arrow direction.



3. Backlights installation

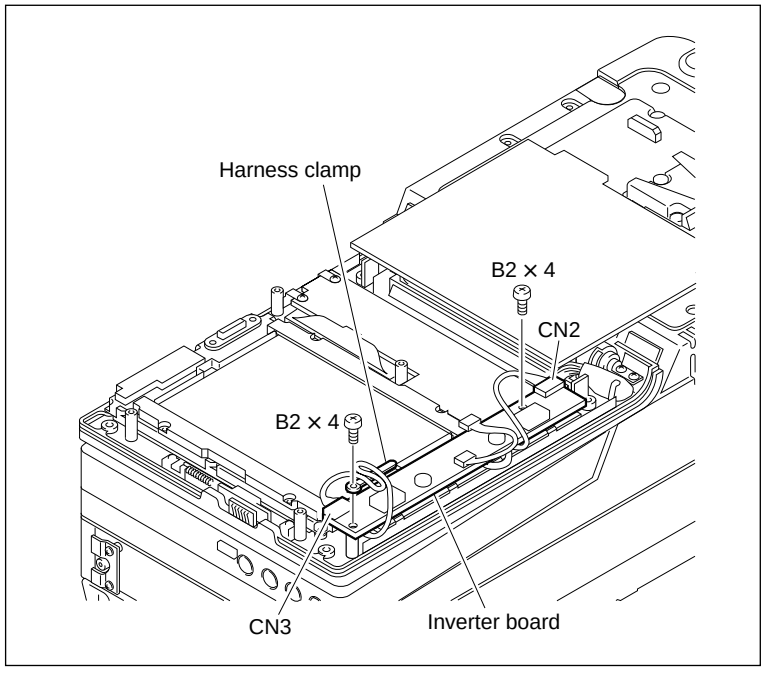
(1) Put the hooks of the new backlights into the holes on the LCD monitor, and move them in the arrow directions. Then tighten them with the four screws.
(2) Attach the LCD monitor with the four screws.
(3) Connect the harness connectors of the backlights to connectors CN2 and CN3 on the inverter board.



(4) Install the inverter board with the two screws.
(5) Clamp the harness of the backlight using the harness clamp as shown in the figure.

4. DP-300 board installation

(1) Connect the connector CN7 of the DP-300 board to the CN-1541 board.
(2) Reinstall the DP-300 board with the four screws.
(3) Reconnect the harness connector disconnected in (1) of step 1 to CN6 on the DP-300 board.



4-17-2. LCD Monitor Replacement

Outline

Replacement

DP-300 board removal
Inverter board removal
LCD monitor removal
LCD monitor installation
Inverter board installation
DP-300 board installation

Precaution

The LCD monitor as the spare part includes the two backlights.

Preparations

1. Turn off the power.
2. Remove the display panel. (Refer to Section 3-1-6.)

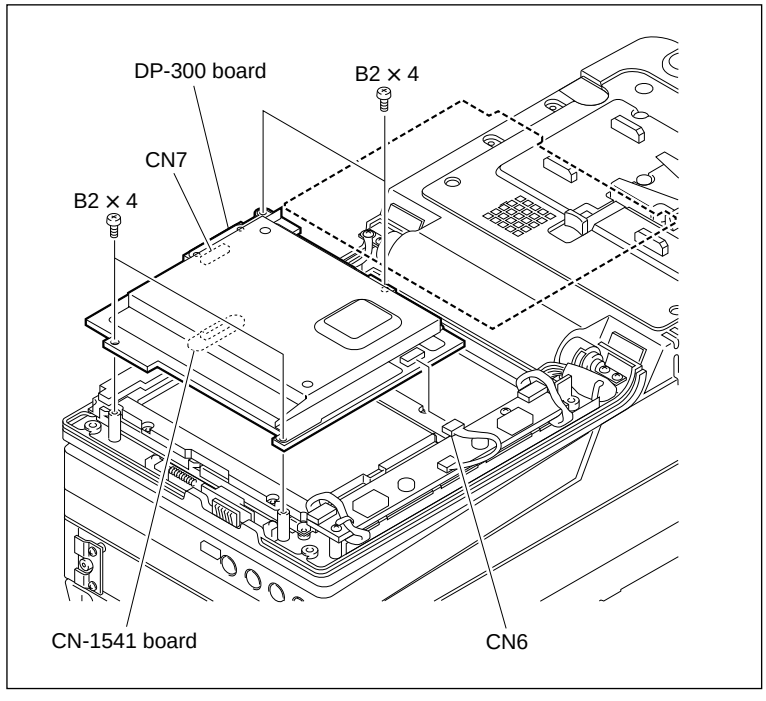
Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A

Replacement

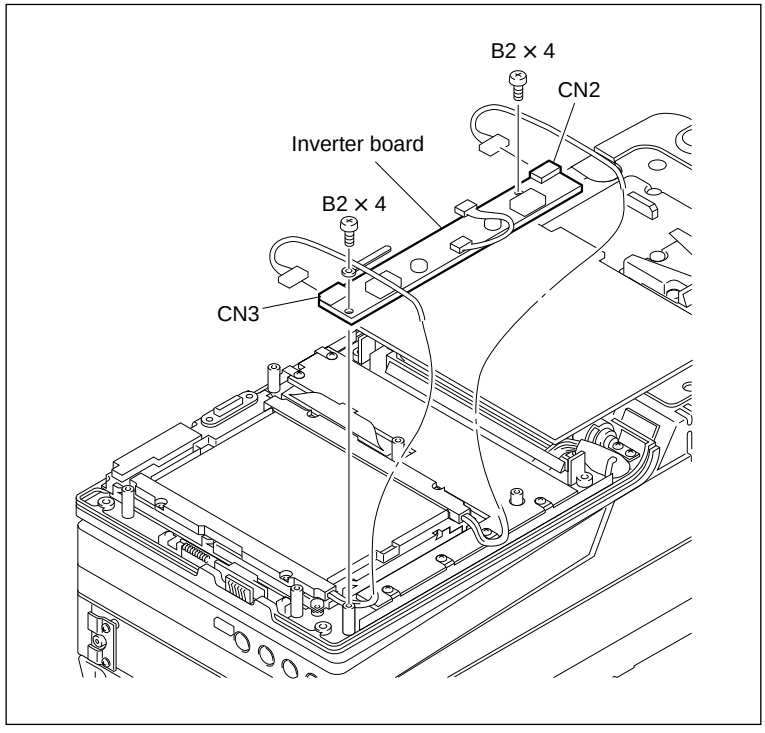
1. DP-300 board removal

(1) Disconnect the harness connector connected to CN6 on the DP-300 board.
(2) Remove the four screws shown in the figure.
(3) Disconnect the connector CN7 connected to the CN-1541 board below the DP-300 board to lift the DP-300 board out.



2. Inverter board removal

(1) Remove the two screws, then remove the inverter board.
(2) Disconnect the two harness connectors of the backlights connected to CN2 and CN3 on the inverter board.

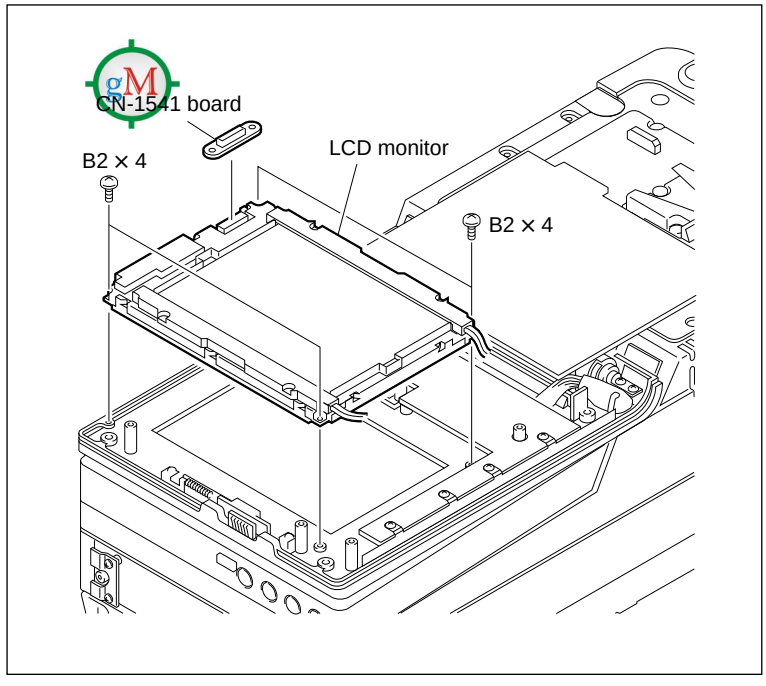


3. LCD monitor removal

(1) Disconnect the CN-1541 board from the LCD monitor.
To re-use the CN-1541 board, be careful not to lose this board.
(2) Remove the four screws to remove the LCD monitor.

4. LCD monitor installation

(1) Install a new LCD monitor with the four screws.
(2) Connect the connector CN1 (A side) of the CN-1541 board to the LCD monitor.

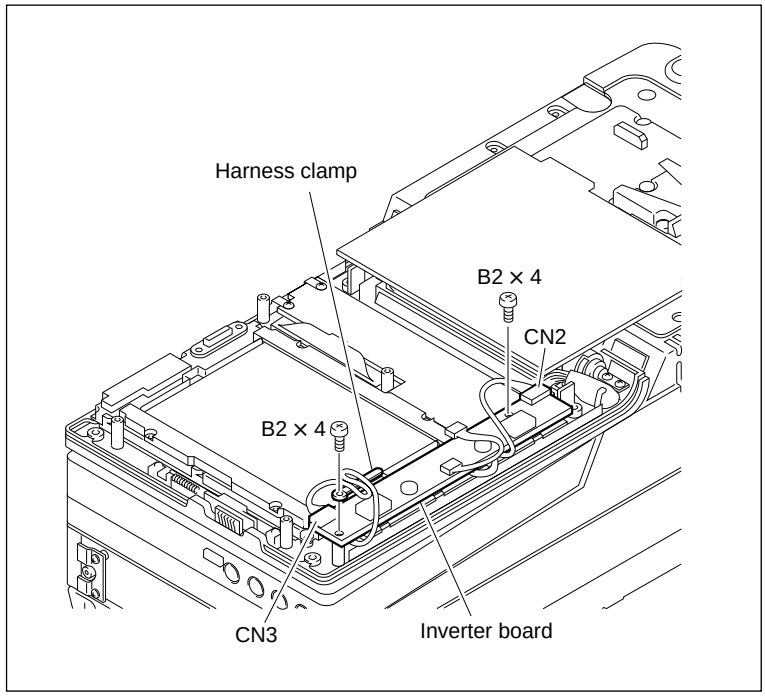


5. Inverter board installation

(1) Connect the harness connectors of the backlights to connectors CN2 and CN3 on the inverter board.
(2) Install the inverter board with the two screws.
(3) Clamp the harness of the backlight using the harness clamp as shown in the figure.

6. DP-300 board installation

(1) Connect the connector CN7 of the DP-300 board to the CN-1541 board.
(2) Reinstall the DP-300 board with the four screws.
(3) Reconnect the harness connector disconnected in (1) of step 1 to CN6 on the DP-300 board.



4-18. Board Replacement

4-18-1. SV-206 Board Replacement

Outline

Replacement

Mechanical deck removal
Harness connector disconnection
SV-206 board removal
SV-206 board installation
Mechanical deck installation

Adjustment after replacement

Servo system adjustment
Tape running adjustment
Video tracking adjustment
CTL head position adjustment
AT head position adjustment

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the bottom plate.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Hexagonal bit: J-6326-120-A

Replacement

1. Mechanical deck removal

Remove the mechanical deck.
(Refer to Section 3-1-8.)

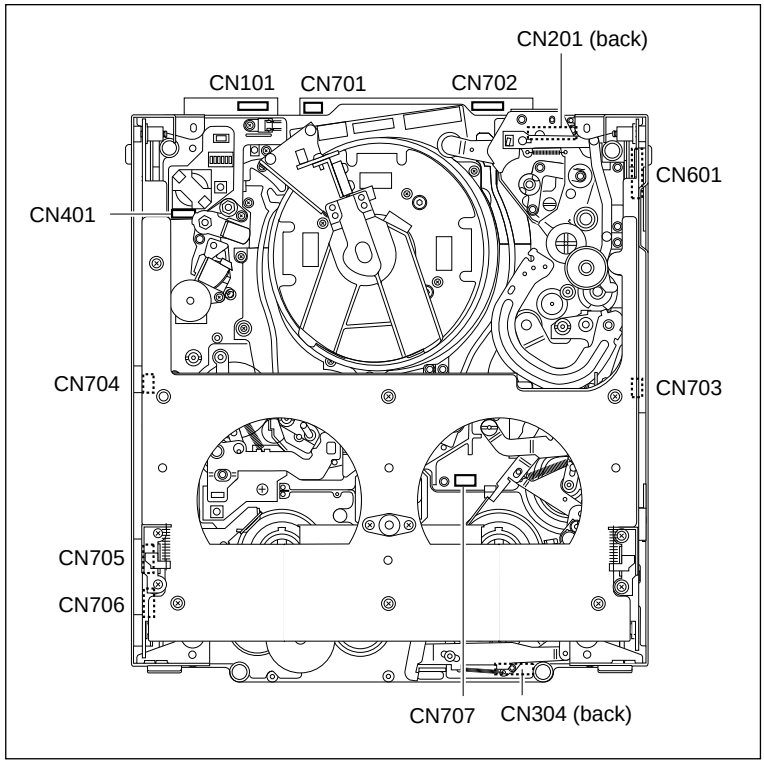
2. Harness connector disconnection

Disconnect the following harness connectors from the SV-206 board.

- CN101 (from drum)
- CN701 (from dew condensation sensor)
- CN702 (from threading motor)
- CN601 (from AT head)
- CN703 (from tape top sensor)
- CN706 (from S brake solenoid)
- CN705 (from tension sensor)
- CN704 (from tape end sensor)
- CN401 (from full erase/CTL head)
- CN707 (from full top sensor)

At the back of SV-206 board

- CN201 (from capstan motor)
- CN304 (from S reel motor)



3. SV-206 board removal

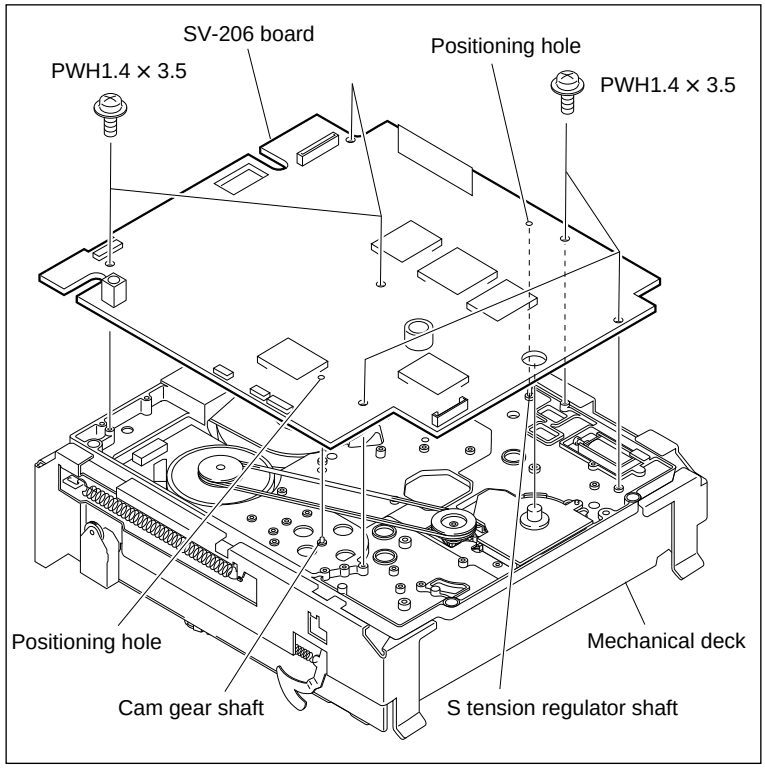
Remove the six screws, then remove the SV-206 board.

4. SV-206 board installation

Install a new SV-206 board in the order of step 3 to 2.

5. Mechanical deck installation

Install the mechanical deck.
(Refer to Section 3-1-8.)



Adjustment after replacement

6. Servo system adjustment

(Refer to Section 7-3.)

7. Tape running adjustment

(Refer to Section 5-4.)

8. Video tracking adjustment

(Refer to Section 5-5.)

9. CTL head position adjustment

(Refer to Section 5-7.)

10. AT head position adjustment

(Refer to Section 5-8.)

4-18-2. RE-174 Board Replacement

Outline

Replacement

RE-174 board removal
RE-174 board installation

Preparations

1. Turn off the power.
2. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M2): J-6325-380-A

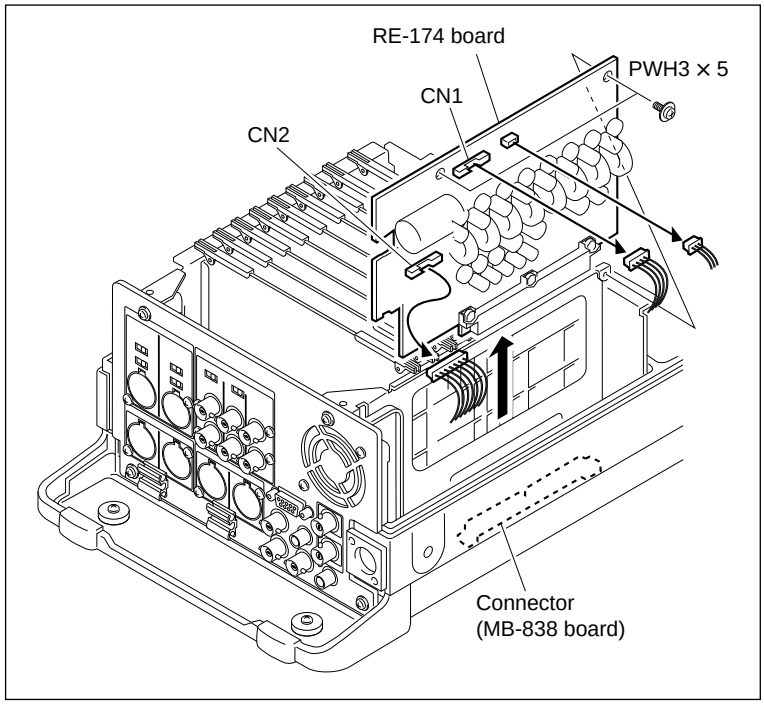
Replacement

1. RE-174 board removal

(1) Disconnect the connector (CN1 and CN5) on the RE-174 board.
(2) Remove the two screws.
(3) Lift the RE-174 board up and disconnect it from the MB-838 board.
(4) Disconnect the harness connector (CN2) connected from the DC IN connector.

2. RE-174 board installation

(1) Connect the harness connector to connector CN2 on a new RE-174 board.
(2) Push the RE-174 board downward and connect it firmly to the connector (CN900) on the MB-838 board.
(3) Fix the RE-174 board to the chassis with the two screws.
(4) Connect the harness connector to connector CN1 and CN5.



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4-18-3. SR-65 Board Replacement

Outline

Replacement

S tension regulator arm assembly removal
SR-65 board replacement
S tension regulator arm assembly installation
Tension regulator guide cleaning

Adjustment after replacement

S tension regulator offset/gain adjustment
Tape running adjustment

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the cassette compartment.
   (Refer to the maintenance manual Part 1, Section 1-7.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Torque screwdriver bit (for M2): J-6325-380-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning fluid: 9-919-573-01

Replacement

1. S tension regulator arm assembly removal

Remove the S tension regulator arm assembly.
(Refer to Section 4-10.)

2. SR-65 board replacement

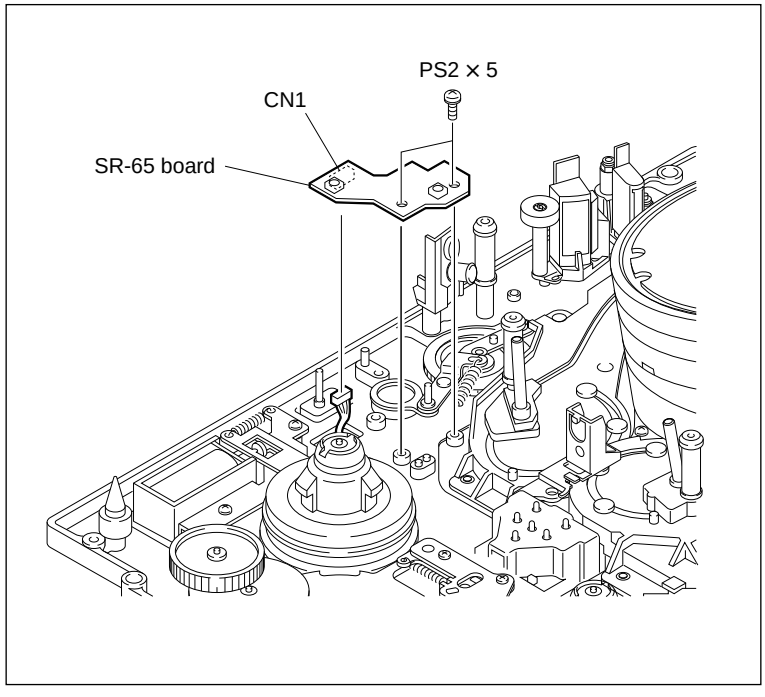
Remove the two screws and disconnect the harness from the connector CN1, and then replace the SR-65 board with a new one.

3. S tension regulator arm assembly installation

Install the S tension regulator arm assembly.
(Refer to Section 4-10.)

4. Tension regulator guide cleaning

(1) Clean the guide roller with cleaning cloth moistened with cleaning fluid.
(2) After cleaning, wipe with dry cloth.



Adjustment after replacement

5. S tension regulator offset/gain adjustment

(Refer to Section 5-2.)

6. Tape running adjustment

(Refer to Section 5-4.)

4-18-4. DC-97 Board (DC IN connector) Replacement

Outline

Replacement

RE-174 board removal
DC-97 board replacement
RE-174 board installation

Preparations

1. Turn off the power.
2. Remove the upper frame. (Refer to the maintenance manual Part 1, Section 1-6.)
3. Remove the bottom plate. (Refer to the maintenance manual Part 1, Section 1-6.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M2): J-6325-380-A

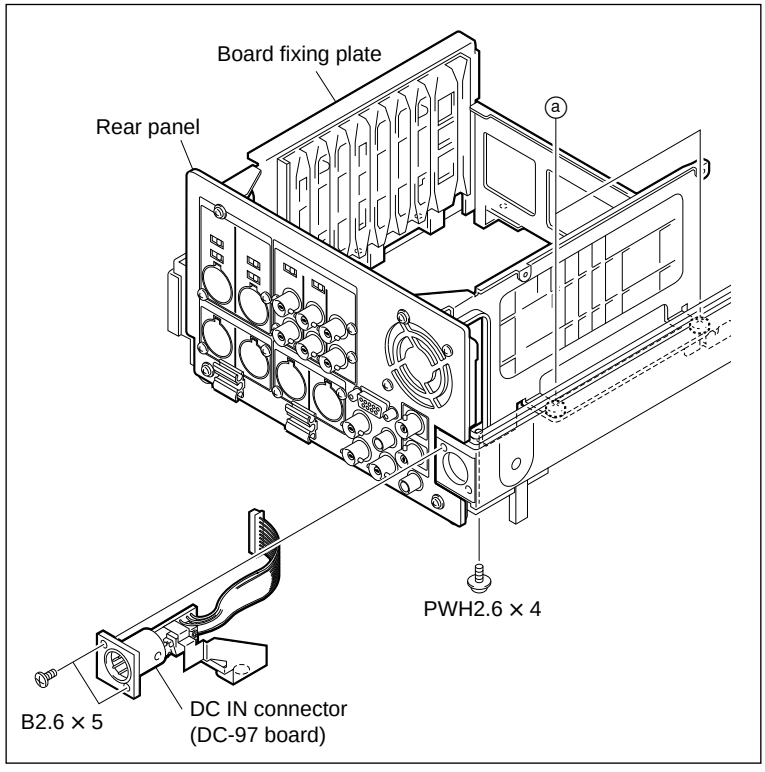
Replacement

1. RE-174 board removal

Remove the RE-174 board.
(Refer to Section 4-18-2.)

2. DC-97 board replacement

(1) Loosen the screw ⓐ fixing the board fixing plate.
(2) Remove the two screws fixing the DC IN connector on the rear panel of the unit.
(3) Remove the DC IN connector (DC-97 board) from the unit.
(4) Put a new DC IN connector (DC-97 board) into the round hole of the unit with the board placed on its left side and install it with two screws removed in step (2).



3. RE-174 board installation

Reinstall all the boards in the reverse order of steps 1 to 2.

4-18-5. HP-88 Board Replacement

Outline

Replacement

Shield sheet removal
HP-88 board replacement
Shield sheet installation

Preparations

1. Put the uint into the unthreading end state.
2. Turn off the power.
3. Remove the bottom frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the DM-121 board.
   (Refer to the maintenance manual Part 1, Section 1-8-2.)

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M2): J-6325-380-A

Replacement

1. Shield sheet removal

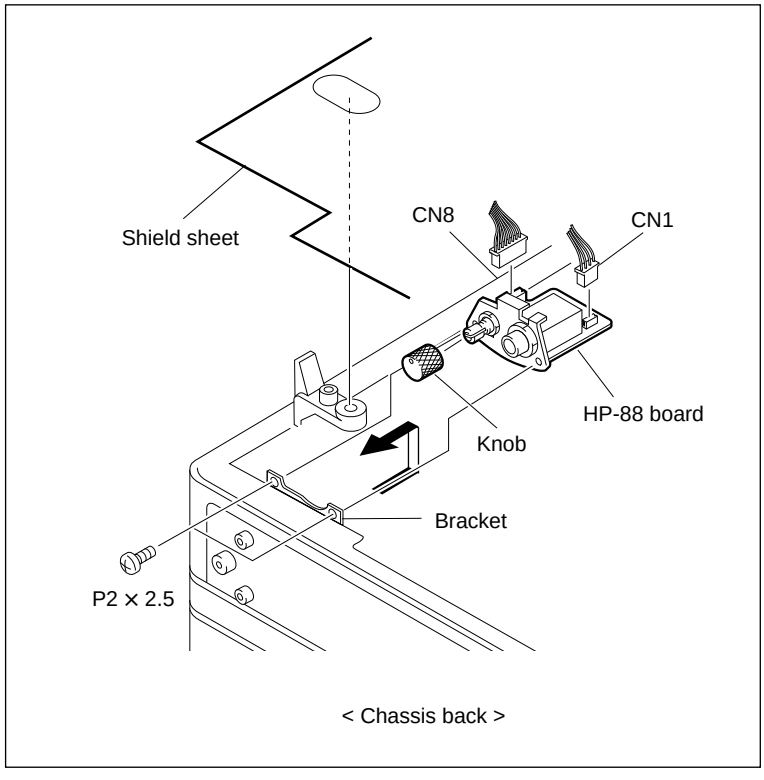
Remove the shield sheet from the chassis.

2. HP-88 board replacement

(1) Disconnect the harness connectors connected to connectors CN1 and CN8 on the HP-88 board.
(2) Remove the two screws, and then remove the HP-88 board in the direction of the arrow.
(3) Remove the knob.
(4) Attach the knob to a new HP-88 board.
(5) Attach the HP-88 board to the bracket with the screw.
(6) Connect the harness connectors to connectors CN1 and CN8.

3. Shield sheet installation

Place the shield sheet onto the chassis.



4-18-6. PSW-63 Board Replacement

Outline

Replacement

Power switch block removal
PSW-63 board replacement
Power switch block installation

Preparations

1. Put the unit into the unthreading end state.
2. Turn off the power.
3. Remove the upper frame.
   (Refer to the maintenance manual Part 1, Section 1-6.)
4. Remove the bottom plate.
   (Refer to the maintenance manual Part 1, Section 1-6.)

Replacement

1. Power switch block removal

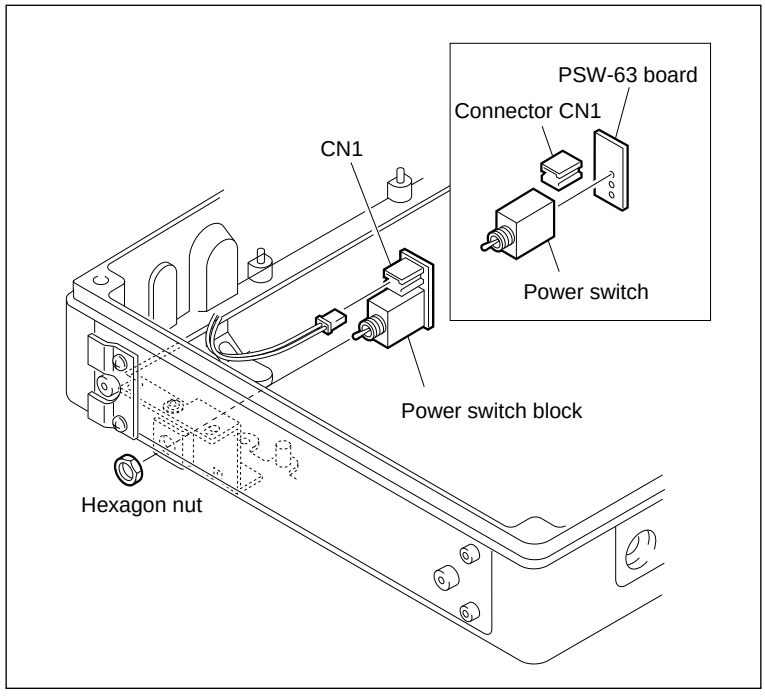
(1) Remove the hexagon nut fixing the power switch, then remove the power switch block.
(2) Disconnect connector CN1 connected to the PSW-63 board.

2. PSW-63 board replacement

(1) Remove the PSW-63 board soldered to the power switch.
(2) Unsolder connector CN1 from the removed PSW-63 board and solder it to a new PSW-63 board.
(3) Solder the new PSW-63 board to the power switch.

3. Power switch block installation

(1) Connect the harness connector to connector CN1 on the PSW-63 board.
(2) Install the power switch block in the unit using a hexagon nut so that the connector CN1 on the PSW-63 board faced to the mechanical deck.



4-18-7. DP-300 Board Replacement

Outline

Replacement

Display panel cover removal
DP-300 board replacement
Display panel cover installation

Preparation

1. Turn off the power.

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M2): J-6325-380-A

Replacement

1. Display panel cover removal

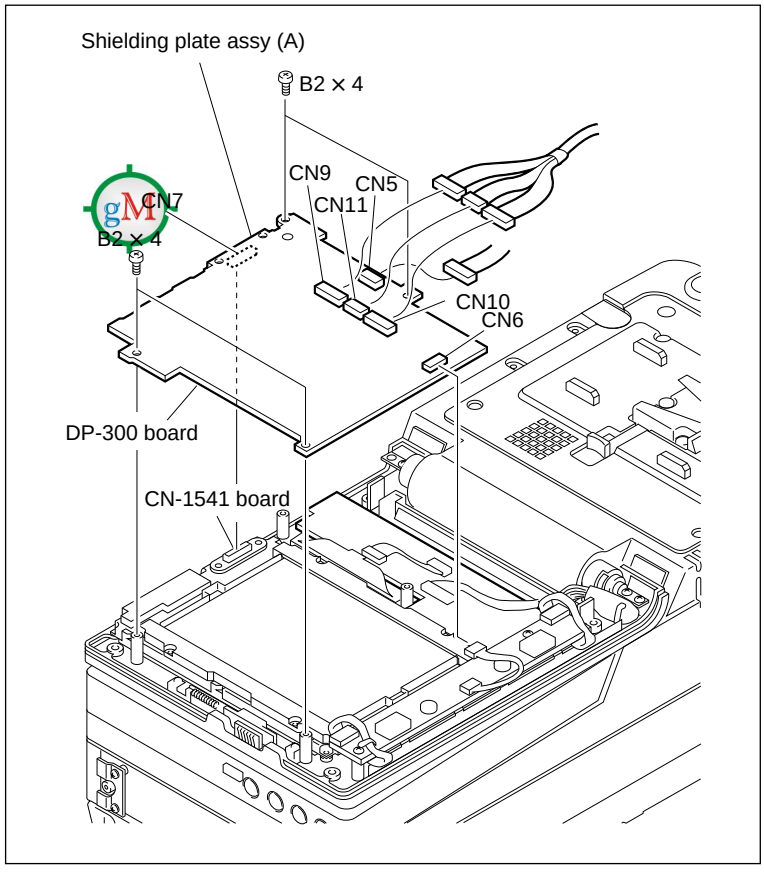
Remove the display panel cover.
(Refer to Section 3-1-6.)

2. DP-300 board replacement

(1) Disconnect the harness connectors from the connectors CN5, 6, 9, 10 and 11 on the DP-300 board.
(2) Remove the four screws.
(3) Disconnect connector CN7 connected to the CN-1541 board below the DP-300 board while lifting the DP-300 board up.
(4) Install a new DP-300 board in the reverse order of steps.

3. Display panel cover installation

Install the display panel cover.
(Refer to Section 3-1-6.)



4-18-8. DP-264 Board Replacement

Outline

Replacement

Display panel cover removal
Inverter board removal
DP-264 board replacement
Inverter board installation
Display panel cover installation

Preparation

1. Turn off the power.

Tools

- Torque screwdriver (3 kg•cm): J-6325-400-A
- Torque screwdriver bit (for M2): J-6325-380-A

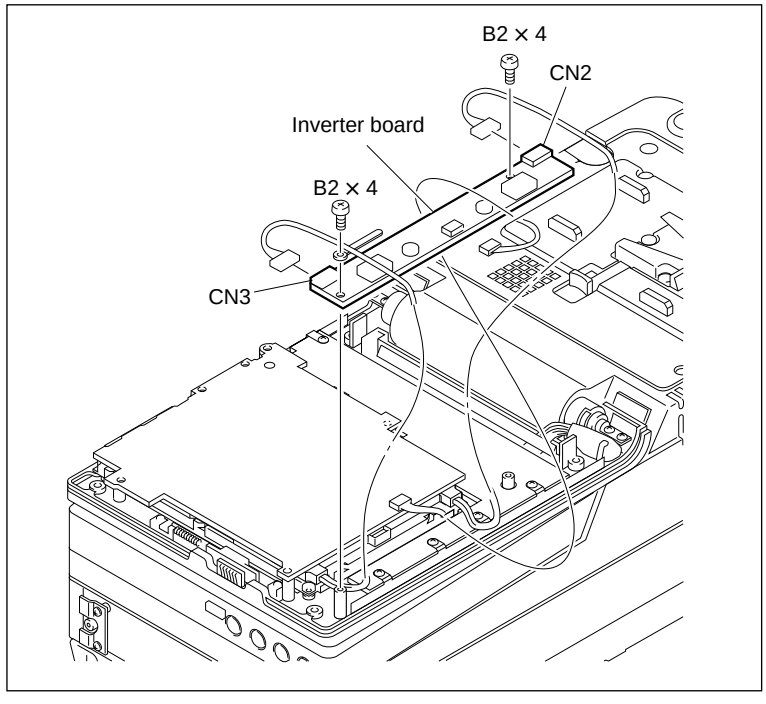
Replacement

1. Display panel cover removal

Remove the display panel cover.
(Refer to Section 3-1-6.)

2. Inverter board removal

(1) Disconnect the harness connectors from the connectors CN1, CN2 and CN3 on the inverter board.
(2) Remove the two screws, then remove the inverter board.



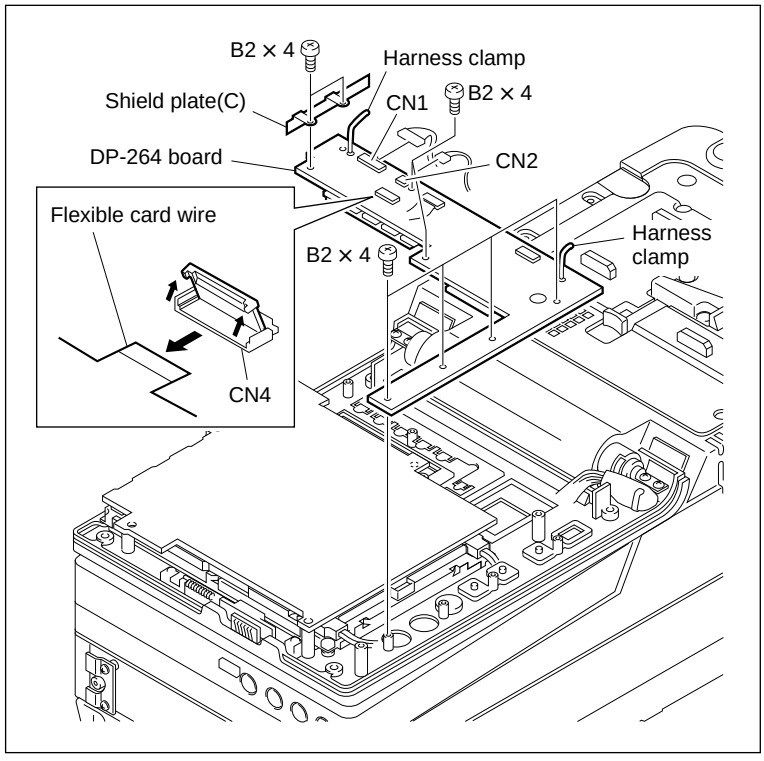
3. DP-264 board replacement

(1) Extend the two harness clamps on the DP-264 board and release the harness bundling.
(2) Disconnect the flexible card wire from the connector CN4 on the DP-264 board.

Note

Be careful not to damage the flexible card wire when it is disconnected.

(3) Disconnect the harness connectors connected to connectors CN1 and CN2 on the DP-264 board.
(4) Remove the eight screws, then remove the DP-264 board.
(5) Install a new DP-264 board in the reverse order of steps (1) to (4).



4. Inverter board installation

Install the inverter board in the reverse order of steps (1) to (2) in step 2.

5. Display panel cover installation

Install the display panel cover.
(Refer to Section 3-1-6.)

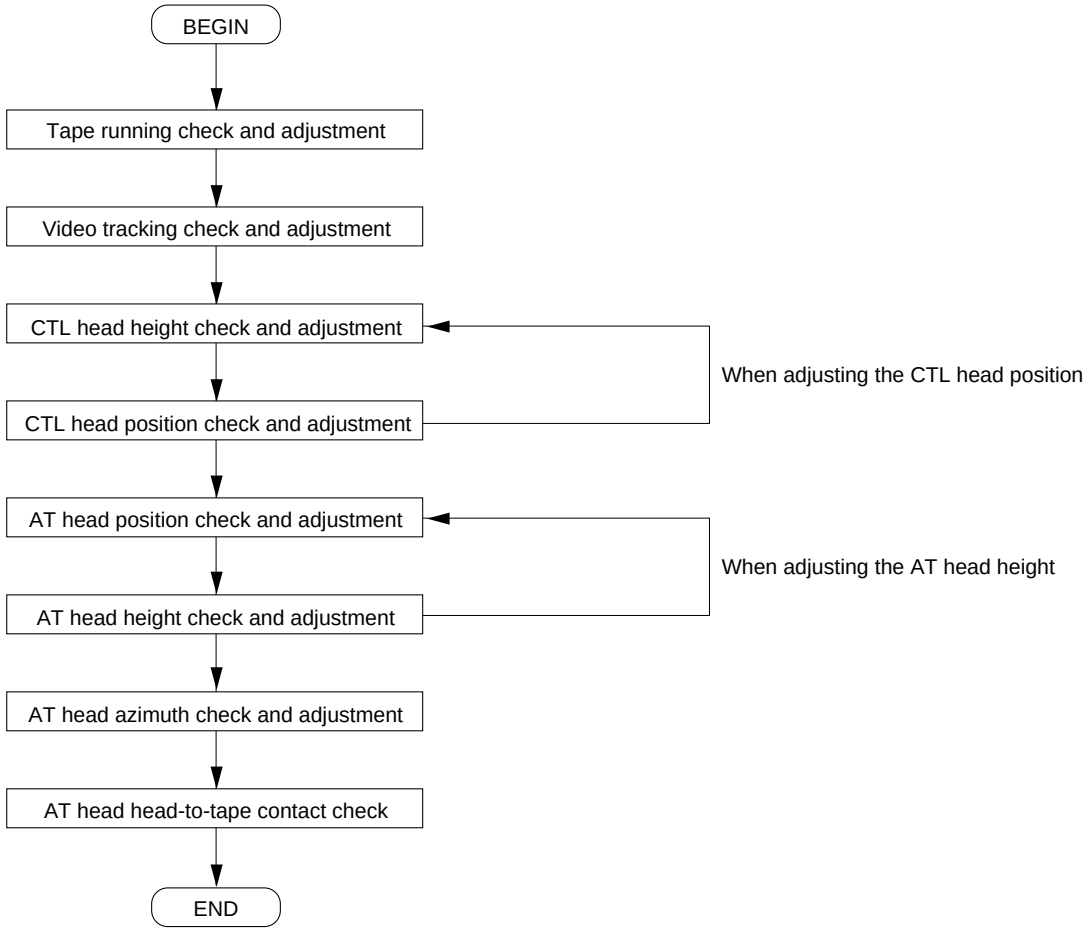
Section 5
Tape Path Alignment

5-1. General Information on Tape Path Adjustment

This section describes the fundamental knowledge such as preparation and prior knowledge to perform the tape path system check and adjustment.

1. Index

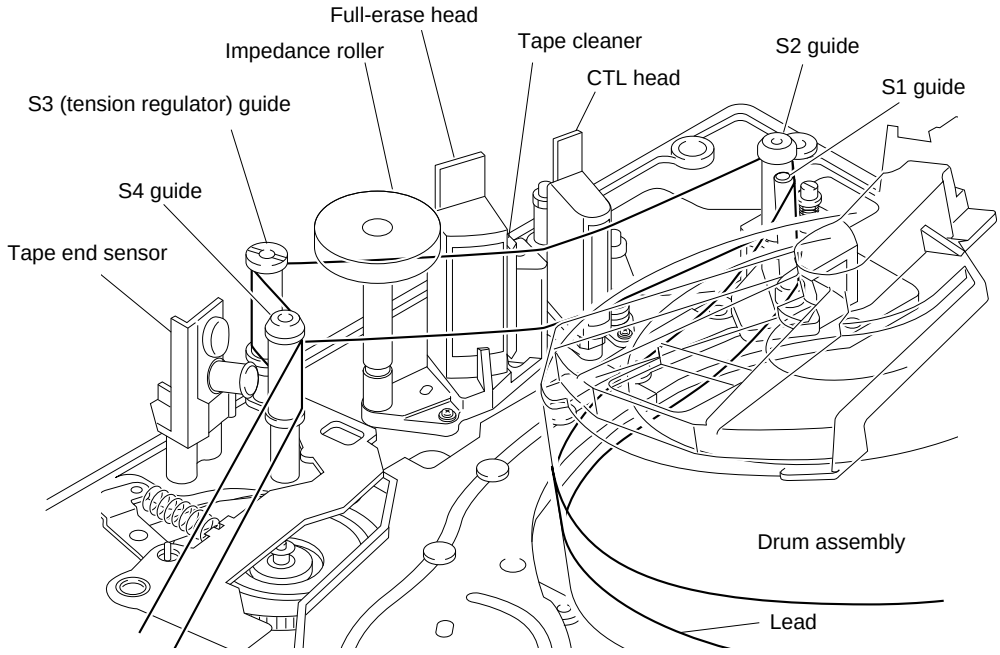
The checks and adjustments described in Section 5-4 through Section 5-11 are closely related to each other.
Perform the checks and adjustments referring to the following flow chart.


BEGIN
Tape running check and adjustment
Video tracking check and adjustment
CTL head height check and adjustment
CTL head position check and adjustment
When adjusting the CTL head position
AT head position check and adjustment
AT head height check and adjustment
When adjusting the AT head height
AT head azimuth check and adjustment
AT head head-to-tape contact check
END

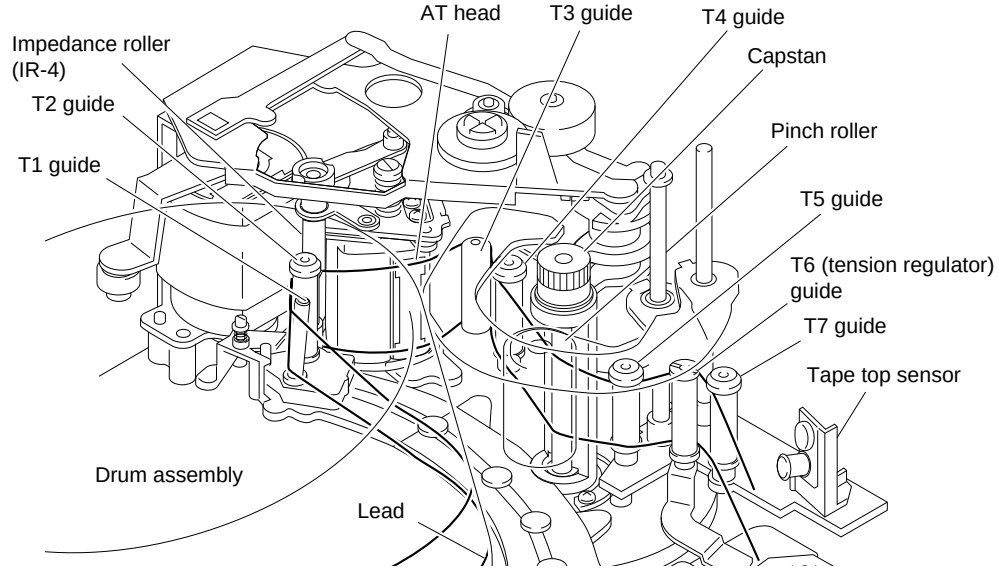
2. Parts location of the tape running system

Following figure describes the names of each component part of the tape running system.

Drum entrance side (threading end mode)



Drum exit side (threading end mode)



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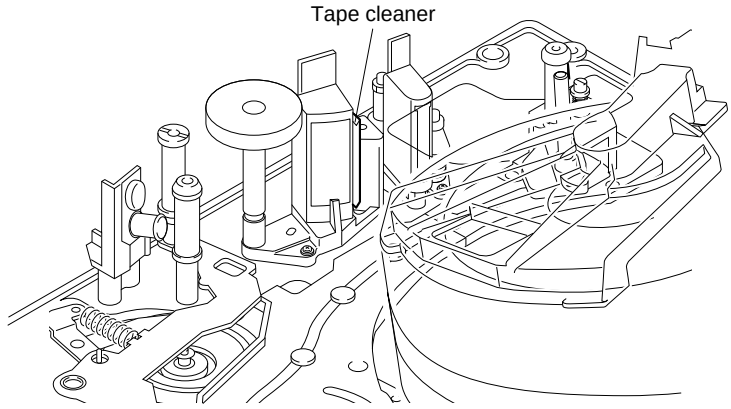
3. Tape cleaner

CAUTION

Never contact the tape cleaner placed between full erase head and CTL head with bare hand.
It is danger of cutting your finger because the tape cleaner has a sharp edge.
Pay careful attention when adjusting the CTL head and so on.



4. Tools and other equipment

Tools

- Tape guide adjustment driver (45): J-6322-420-A
- Inspection mirror: J-6080-840-A
- Torque cassette (FWD back ten.) (MW-389): J-6323-890-A
- Parallel pin (d = 2.0 mm): 3-703-358-04
- Torque screwdriver bit (for M1.4): J-6325-110-A
- Nutdriver (s = 4.5 mm): 7-700-751-01
- Torque screwdriver (3 kg•cm): J-6325-400-A
- Cleaning cloth (15 cm × 15 cm): 3-184-527-01
- Cleaning liquid: 9-919-573-01
- Screw locking compound: 7-432-114-11
- Alignment tape, CR2-1B: 8-960-096-01
- Alignment tape, CR8-1A (Oxide): 8-960-097-45

Note

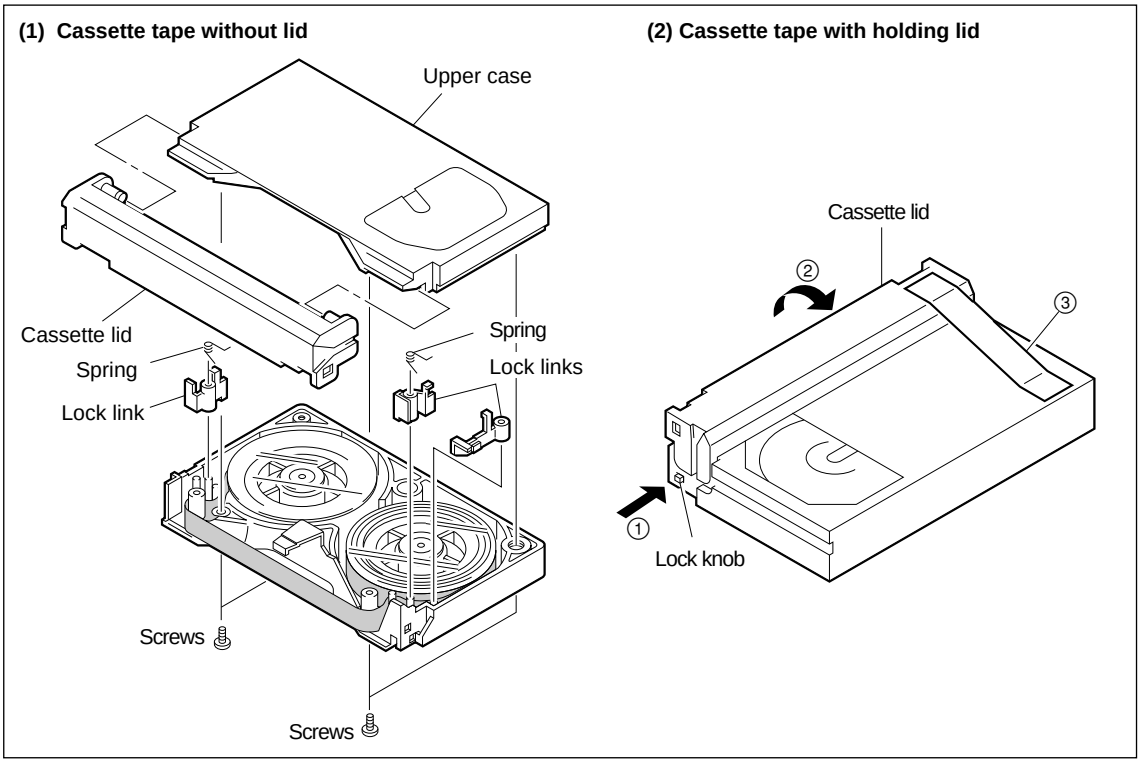
Refer to Section 1-4 about the contents of the alignment tapes.

Other Equipment

- Betacam tape, BCT-30MA (Commercially available)
- Oscilloscope (Tektronix 2465B or equivalent)
- DC power supply (AC-550/550CE or equivalent)
  (The AC adaptors AC-500 and AC-DN1 cannot be used to derive power.)
- Weight about 1000 g (It is smaller than S type cassette tape in size.)
- Bamboo stick

5. Cassette tape using the tape path adjustment

The tape path adjustment should be performed under the state that the cassette compartment is removed. Then, it is necessary to make a following modification (1) or (2) to the cassette tape and alignment tape that are used for the tape path adjustment.



(1) Cassette tape without lid
Disassemble the cassette tape, and take off the cassette lid, springs and lock links shown in the figure.

(2) Cassette tape with holding lid
Open the cassette lid (②) while pushing the lock knob (①), and fix the cassette lid using an adhesive tape (③).

When putting the cassette tape or alignment tape on the VTR, put it on the cassette posts on the mechanical deck. And then, put a weight on the cassette tape so that it does not rise up. The weight abut 1000 g is suitable.

6. Cleaning

Clean the following tape running surfaces before performing the tape path adjustment.

- Tape running surface of the upper drum and video heads
- Tape running surfaces of the lower drum and lead
- Stationary heads and tape cleaner
- Tape guides

How to clean these portions, refer to the maintenance manual Part 1, Section 4-2.

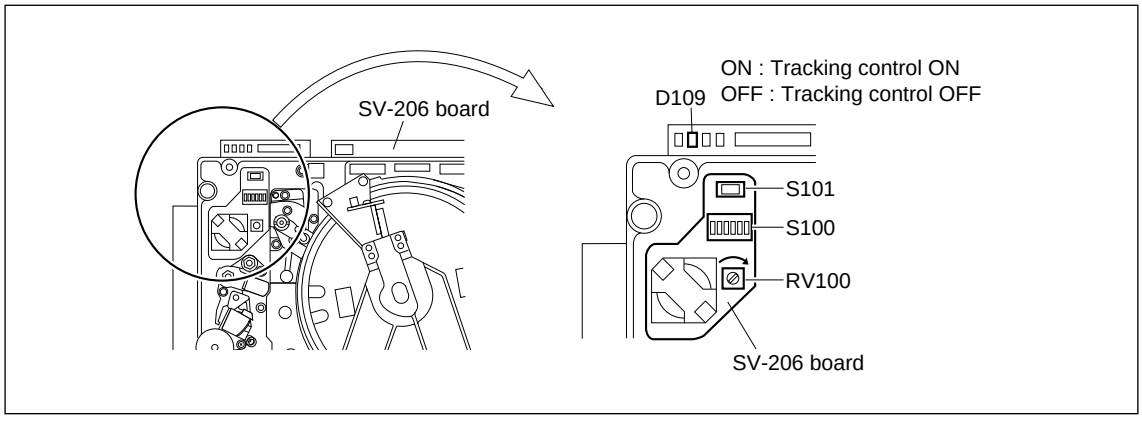
7. Tracking control

The auto tracking control function operates under the normal operation. To adjust the video tracking manually, this auto tracking control function should be set to off.
In this sate, the tracking control operation using the tracking VR is available.

To activate the tracking VR:
1. Turn the power on.
2. Hold the switch S101 on the SV-206 board down about three seconds.
   And then, the indicator D109 illuminates. It shows that the RV100 becomes enable as the tracking VR.

Any way of the followings exits the manual tracking control. After performing it, the indicator D109 goes out.

To return to the auto tracking control:
- Hold the switch S101 on the SV-206 board down about three seconds.
- Press the EJECT button.
- Turn the power off.



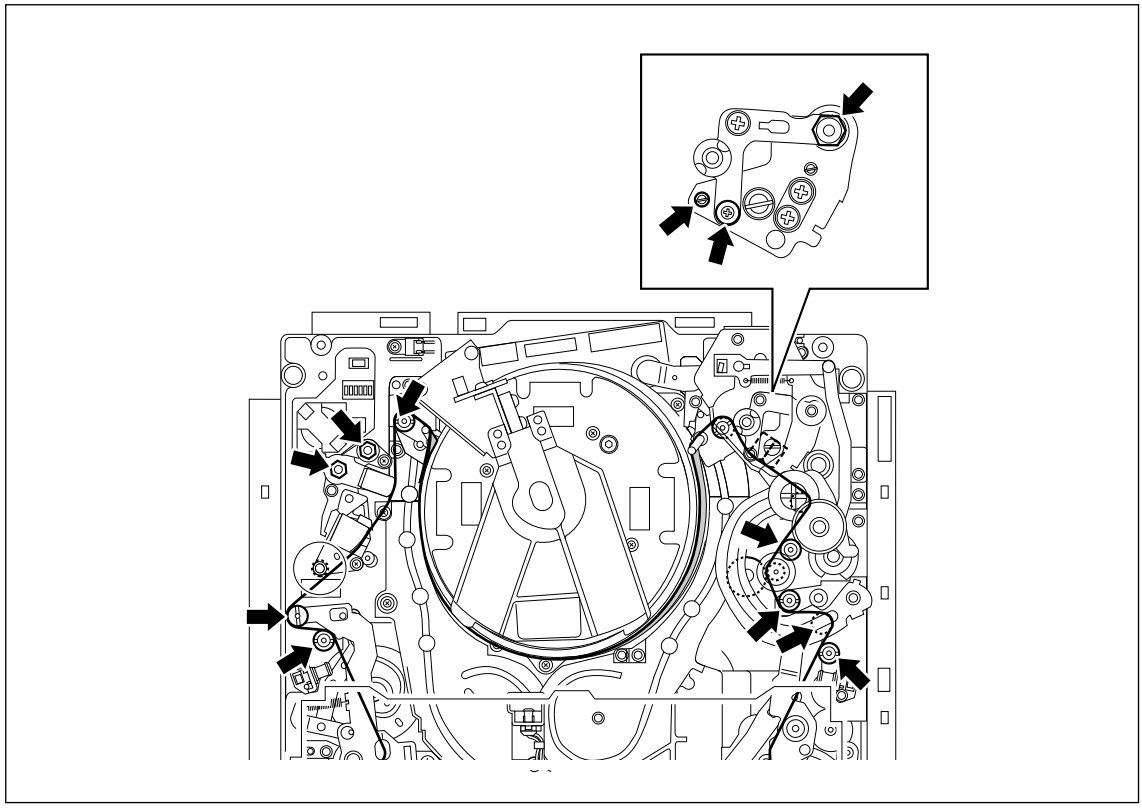
8. Cassette compartment

The tape path adjustment should be performed with the cassette compartment is removed.
Set the switch S100-1 on the SV-206 board to ON so that the unit put into the cassette compartment locked state electrically.
After adjustment is completed, be sure to set this switch back to the former position (OFF).

9. Locking compound

When loosening or tightening the following screws, apply locking compound to the screws after adjustment is completed.
The locking compound that applied to other surrounding parts must be wiped off with gauze or soft cloth.

• Locking compound : 7-432-114-11



5-2. S Tension Regulator Offset/Gain Adjustment

Precaution

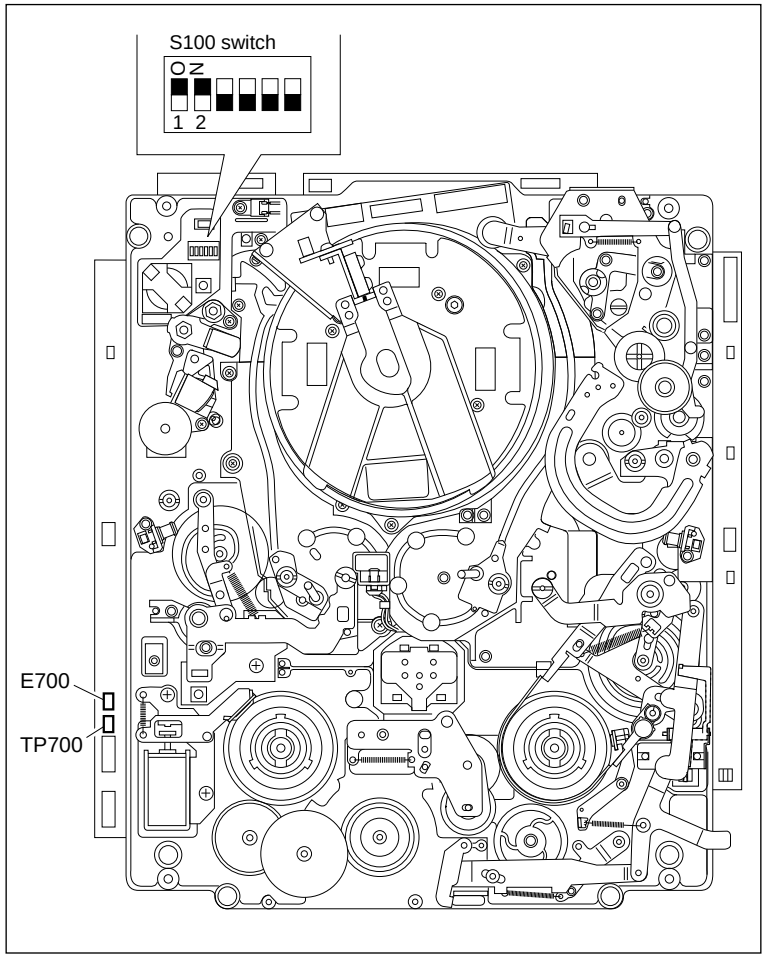
Be sure to perform this adjustment after replacing the S main brake shoe, S reel motor, S reel table and so on.

Tools

- Torque cassette (FWD back ten.) (MW-389): J-6323-890-A
- Parallel pin (d = 2.0 mm): 3-703-358-04
- Oscilloscope (Tektronix 2465B or equivalent)

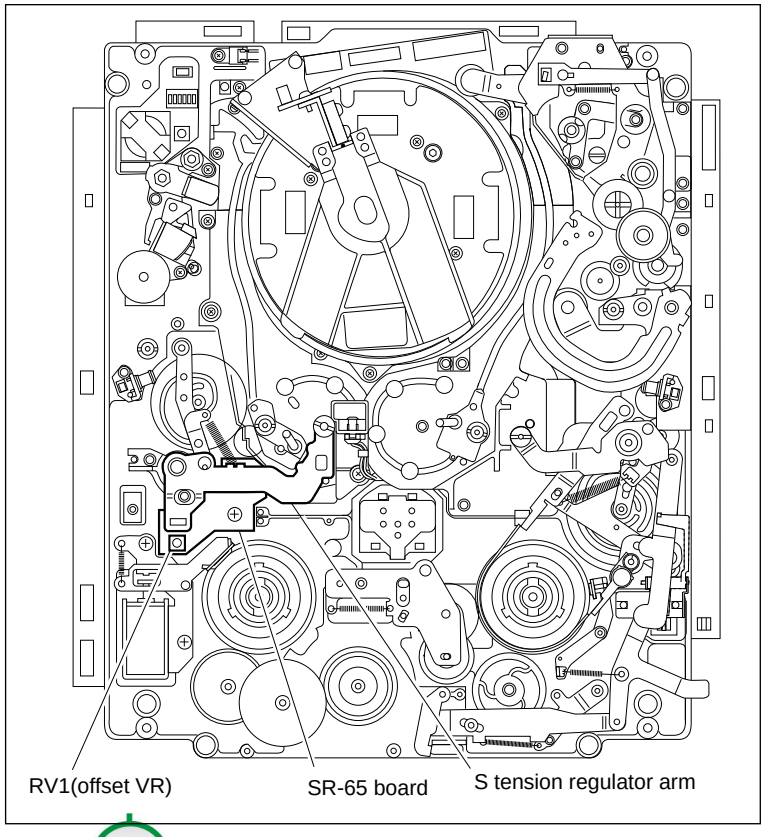
Preparations

1. Turn off the power.
2. Remove the upper frame without disconnecting the harness connectors. (Refer to the maintenance manual Part 1, step (1) to (4) in Section 1-6-2.)
3. Remove the cassette compartment. (Refer to the maintenance manual Part 1, Section 1-7.)
4. Connect the oscilloscope as follows;
   CH-1: TP700/SV-206
   CH-2: E700/SV-206
   CH-1: DC mode, 0.2 V/DIV
5. Set the switches S100-1 and S100-2 on the SV-206 board to ON.
6. Turn on the power.



1. S tension regulator offset check

(1) Put the unit into the unthreading end state by pressing the EJECT button.
(2) Adjust the output level at TP700 on the SV-206 board for 0 V using RV1 on the SR-65 board, when the S tension requlator arm is in the unthreading end state.



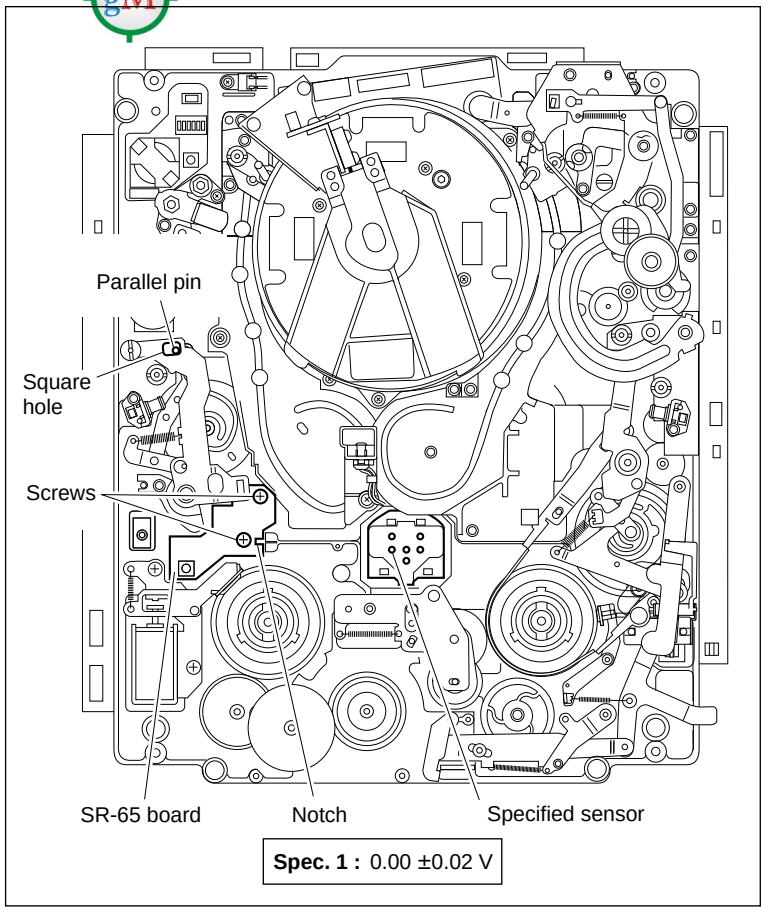
(3) Put the unit into threading end state by pressing the STOP button.
(4) Passing the parallel pin (d = 2 mm) through the square hole on the S tension regulator arm and the round hole on the mechanical deck.
(5) While keeping the state of step (3), check that the output level at TP700 meets the specification 1.

Specification 1: 0.00 ±0.02 V

If the specification is met, perform step 3 and later.
If not, perform step 2 and later.

2. S tension regulator offset adjustment

(1) While keeping the previous step, loosen the two screws fixing the SR-65 board about one or two turn.
(2) Insert the flatbladed screwdriver (3 mm) into the notch of the SR-65 board, adjust the position of the board to meet the specification 1.
(3) Tighten the two screws loosened in step (1).
Tightening torque:
20×10^{-2} N•m {2.0 kgf•cm}
(4) Recheck the output level at TP700 to meet the specification referring to step 1.



3. S tension regulator gain check

Note

Before performing this check and adjustment, be sure to check that the S tension regulator offset adjustment meets the Specification 1.

(1) While keeping the previous step, push the S tension regulator arm in the arrow direction with finger until the left side of the square hole of the arm contacts with the parallel pin.
(2) While keeping the state of step (1), check the output level at TP700 meets the specification 2.

Specification 2: −1.00 ± 0.04 V

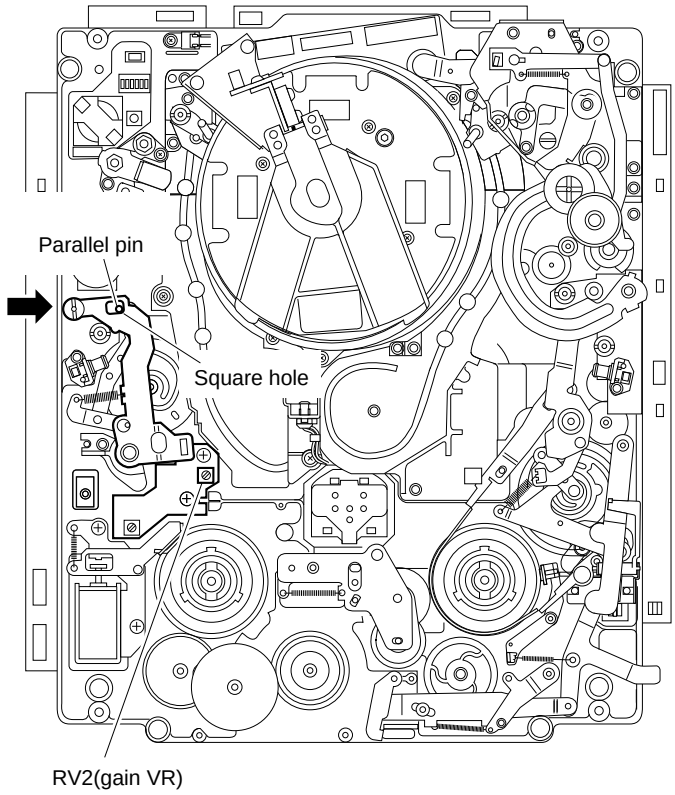
If not to meet the specification, perform step 4.

4. S tension regulator gain adjustment

(1) While keeping the previous step, adjust RV2 (gain VR) on the SR-65 board to meet the specification 2.
(2) Perform the S tension regulator gain check again according to above mentioned step 3. If not to meet the specification, perform adjustment again.

Note

After checks and adjustments are completed, be sure to set switches S100-1 and S100-2 on the SV-206 board to OFF.



Spec. 2 : −1.00 ±0.04 V

5-3. Back Tension Check and Adjustment

This section describes the FWD and REV back tension checks and adjustments. Be sure to perform checks and adjustments after replacing the following parts.

- S reel table
- S reel motor
- S tension regulator arm
- T reel table
- Tension regulator band
- T tension regulator arm

5-3-1. FWD Back Tension Check and Adjustment

Be sure to perform this check and adjustment when replacing the S reel table, S reel motor and S tension regulator arm, and when performing the S tension regulator offset/gain adjustment.

Tool

- Torque cassette (FWD back ten.) (MW-389): J-6323-890-A

Preparations

1. Check that the unit is in the unthreading end state.
2. Turn off the power. (Refer to the maintenance manual Part 1, Section 1-6-2.)
3. Remove the upper frame without disconnecting the harness connectors. (Refer to the maintenance manual Part 1, step (1) to (4) in Section 1-6-2.)
4. Remove the cassette compartment and extened it with the extension harness. (Refer to Section 1-1.)
5. Set the switch S100-1 on the SV-206 to ON.
6. Turn on the power.
7. Place the torque cassette to the unit, and put the weight (about 1000 g) on the torque cassette.

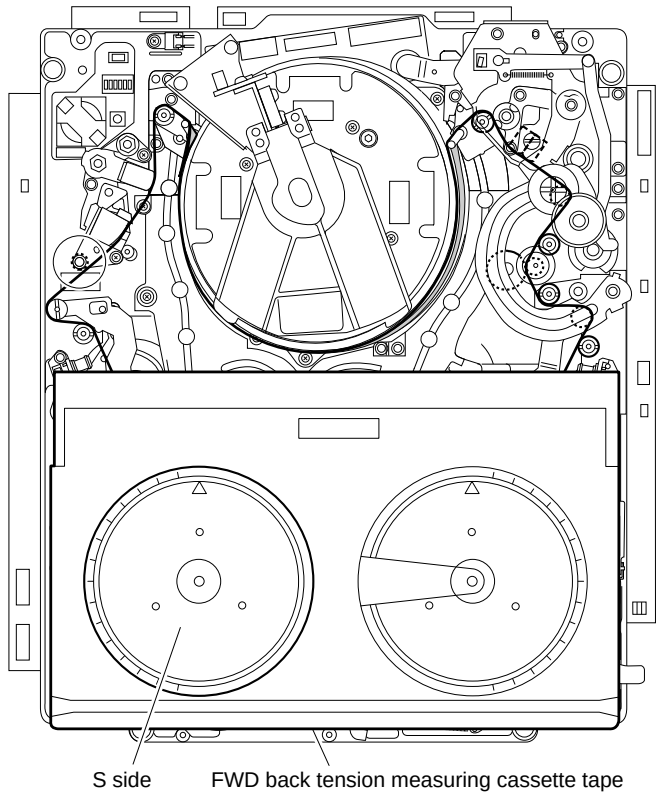
Check procedure

1. FWD back tension check

(1) Put the unit into the PLAY mode.
(2) Check that the indication at S side of the torque cassette meets the specification.

Specification:
$590 \times 10^{-5} \pm 78 \times 10^{-5}$ N•m {60 ±8 gf•cm}

If not to meet the specification, perform step 2.



Spec. : $590 \times 10^{-5} \pm 78 \times 10^{-5}$ N•m {60 ±8 gf•cm}

Adjustment procedure

2. FWD back tension adjustment

(1) Press the EJECT button, then unthreads the tape.
(2) Take out the torque cassette.
(3) Hook the spring on another concave of the hole of the S tension regulator drawer arm.

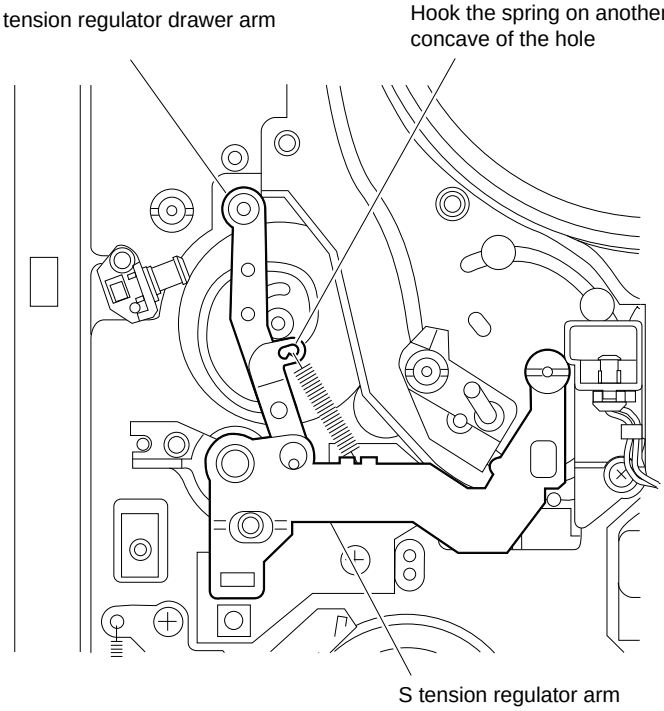
Note

If the spring is hooked on another concave, the back tension value deviates by up to ±3 gf•cm from the specification 1.
When the specification is not met even if the spring is hooked on another concave, stretch out (extend) or bend (shorten) the hook of the spring.

(4) Recheck the FWD back tension meets the specification according to step 1.

Note

After check and adjustment are completed, be sure to set switch S100-1 on the SV-206 board to OFF.



5-3-2. REV Back Tension Check and Adjustment

Be sure to perform this check and adjustment when replacing the T reel table, tension regulator band and T tension regulator arm.

Tool

- Torque cassette (FWD back ten.) (MW-389): J-6323-890-A
- Adjustment driver

Preparations

1. Check that the unit is in the unthreading end state.
2. Turn off the power.
3. Remove the upper frame without disconnecting the harness connectors. (Refer to the maintenance manual Part 1, step (1) to (4) in Section 1-6-2.)
4. Remove the cassette compartment. (Refer to the maintenance manual Part 1, Section 1-7.)
5. Set the switches S100-1 and S100-2 on the SV-206 board to ON.

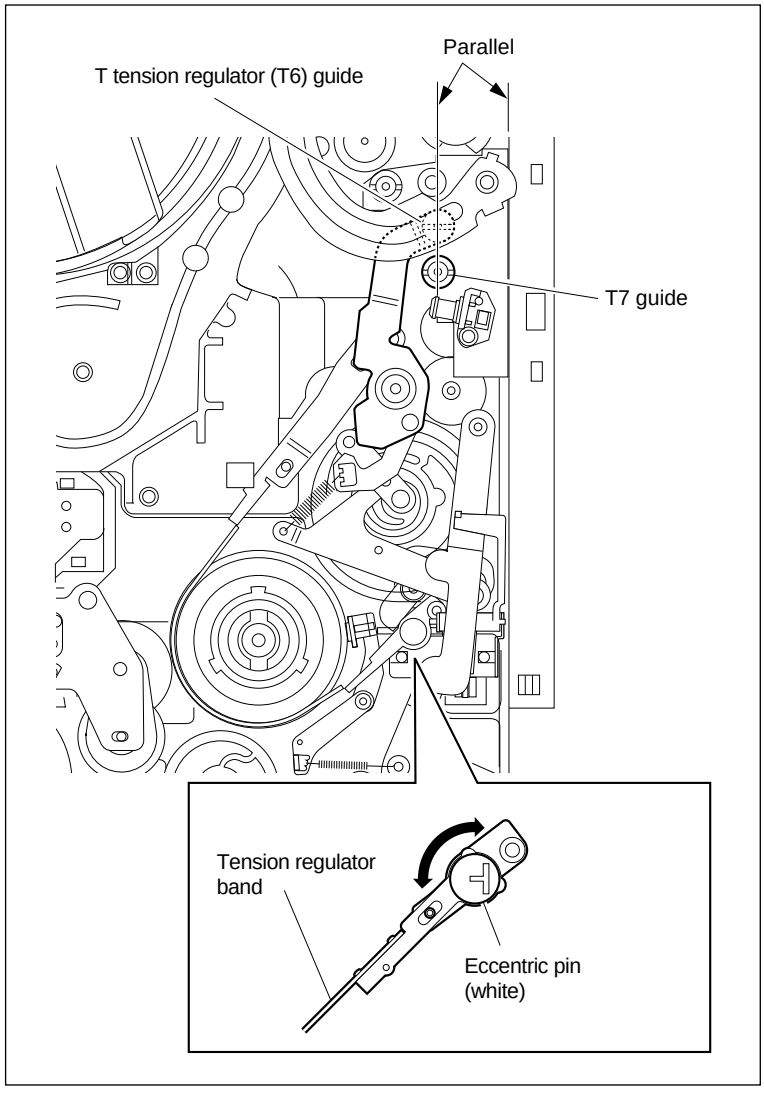
Check procedure

1. T tension regulator arm operating position check

For your reference

Adjust the T tension regulator arm operating position by changing the tension regulator band in length.

(1) Power on the unit and put the unit into the threading end state.
(Refer to the step 1 in Section 4-2.)
(2) Check the positional relationship between the connection line which connect the center-to-center of T tension regulator arm (T6) guide and T7 guide, and the side edge of the mechanical deck is parallel.
(3) If not, adjust the eccentric pin (white) on the tension regulator band using a flatbladed screwdriver so that the positional relationship meets.



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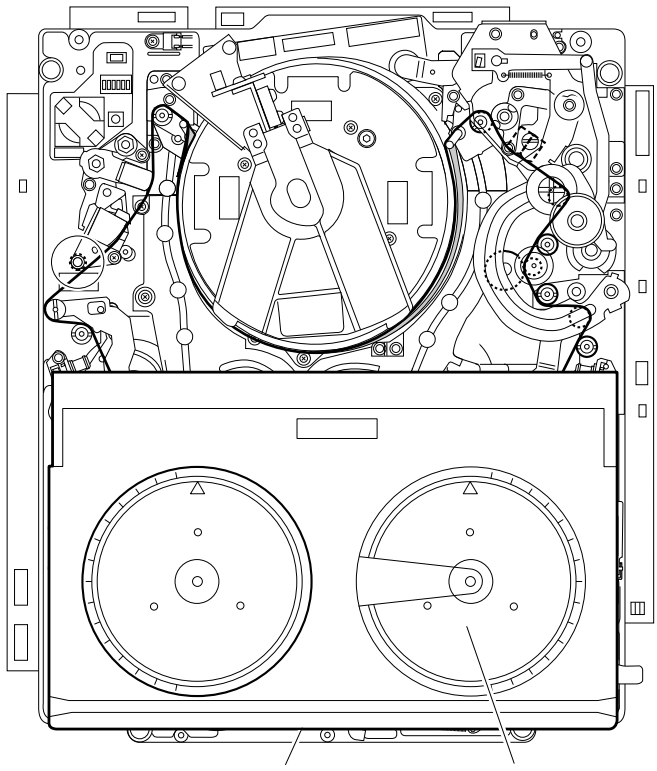
2. REV back tension check

(1) Insert the torque cassette (FWD back ten.) into the unit.
(2) Put the unit into the PLAY mode once, and press the Search button (the unit enters the search mode). Put the unit into REV×1 mode by turning the Search dial.
(3) Check that the indication at T side of the torque cassette meets the specification.

Specification:
$490 \times 10^{-5} \pm 49 \times 10^{-5}$ N•m {50 ±5 gf•cm}

If not to meet the specification, perform step 3.



Spec. : $490 \times 10^{-5} \pm 49 \times 10^{-5}$ N•m {50 ±5 gf•cm}

Adjustment procedure

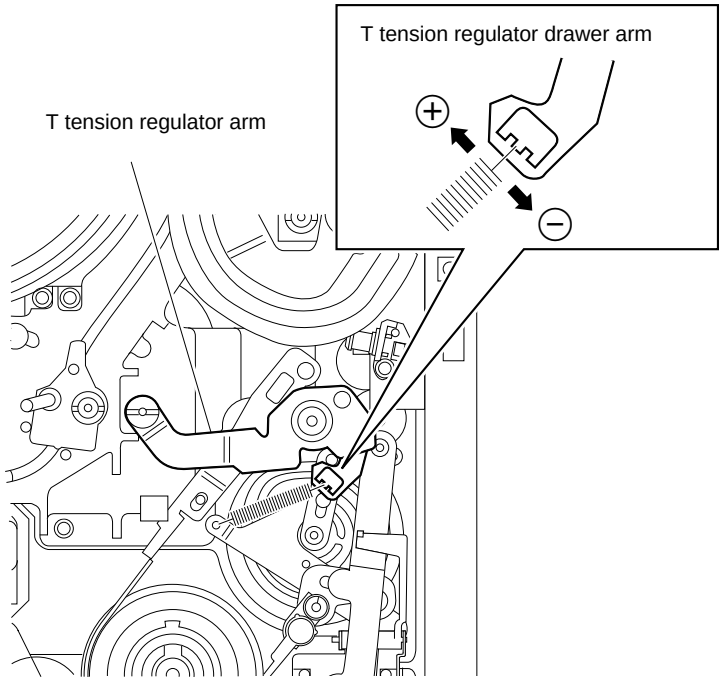
3. REV back tension adjustment

(1) Press the EJECT button, then unthreads the tape.
(2) Take out the torque cassette.
(3) Hook the spring on other concave of the hole of the T tension regulator drawer arm.
- When the meter readout is below the spec. : Hook the spring on ⊕ side concave.
- When the meter readout is over the spec. : Hook the spring on ⊖ side concave.

(4) Recheck the REV back tension meets the specification according to step 2.

Note

After check and adjustment are completed, be sure to set the switch S100-1 on the SV-206 board to OFF.



5-4. Tape Running Check and Adjustment

Note

The tape running condition is closely related with S reel table height and T reel table height.
Before performing this check and adjustment, be sure to perform the S reel table height and T reel table height adjustments. (Refer to step 7 in Section 4-7.)

Tools

- Betacam tape, BCT-30MA (Commercially available)
- Inspection mirror: J-6080-840-A
- Tape guide adjustment driver (45): J-6322-420-A

Preparations

1. Ensure that the unit is in the unthreading end state.
2. Turn off the power.
3. Remove the upper frame without disconnecting the harness connectors. (Refer to the maintenance manual Part 1, step (1) to (4) in Section 1-6-2.)
4. Remove the cassette compartment. (Refer to the maintenance manual Part 1, Section 1-7.)
5. Set the switch S100-1 on the SV-206 board to ON.

Note

After check and adjustment are completed, be sure to set the switch S100-1 to OFF.

Check procedure

1. Set S cassette tape

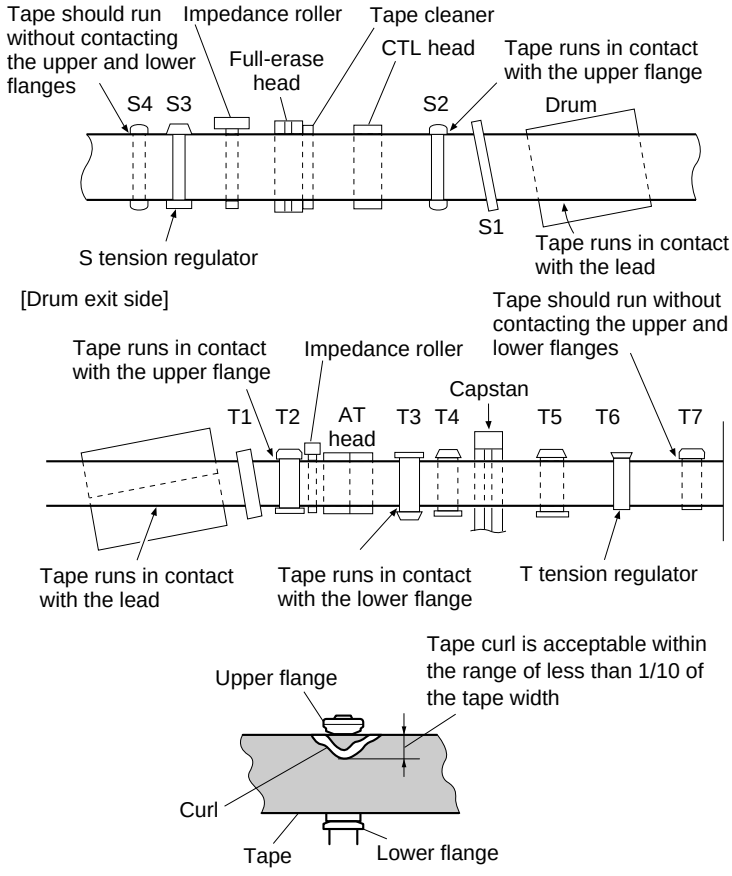
Set the beginning portion of the S cassette tape without lid to the unit, and put the weight (about 1000 g) on the cassette tape.

2. Turn on the power

3. PLAY mode check (At the beginning portion of the tape)

(1) Put the unit into the PLAY mode.

(2) Check the tape running condition satisfies the specification 1.



Spec. 1: (PLAY mode at the beginning portion of the tape)

[Drum entrance side]

- S2 guide
  Tape runs in contact with the upper flange.
- S3 guide (S tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If the tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- S4 guide
  Tape should run without contacting the upper and lower flanges.

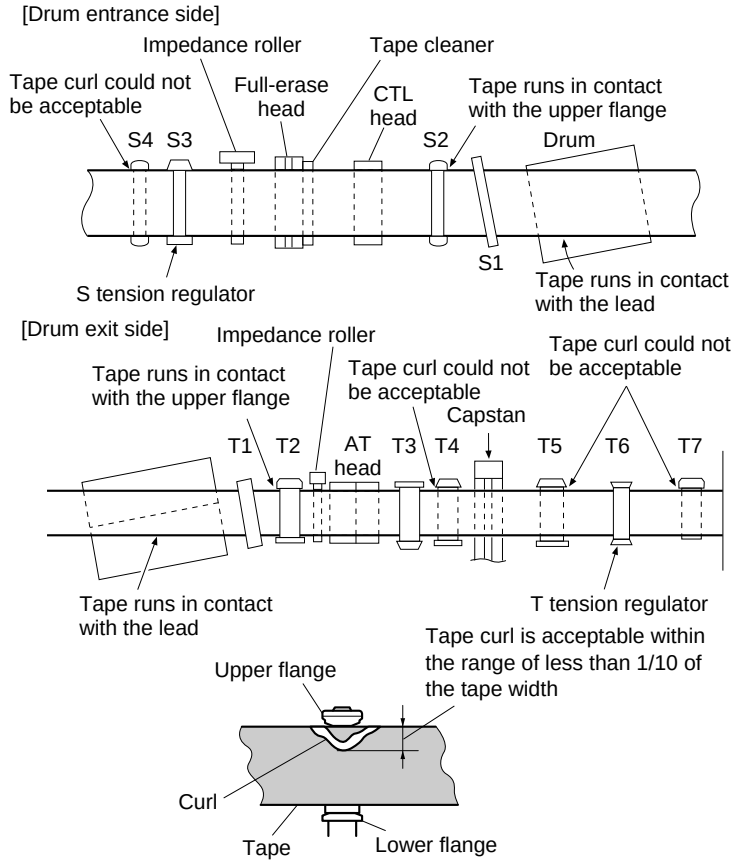
[Drum exit side]

- T2 guide
  Tape runs in contact with the upper flange.
  If tape curl occurs, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T3 guide (T drawer guide)
  Tape runs in contact with the lower flange.
- T4 and T5 guides
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.
- T6 guide (T tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T7 guide
  Tape should run without contacting the upper and lower flanges.
  Even if the tape runs without contacting this tape guide roller, it is acceptable.

4. F FWD mode check (At the beginning portion of the tape)

(1) Put the unit into the F FWD mode.

(2) Check the tape running condition satisfies the specification 2.



Spec. 2: (F FWD mode at the beginning portion of the tape)

[Drum entrance side]

- S2 guide
  Tape runs in contact with the upper flange.
- S3 guide (S tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If the tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- S4 guide
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.

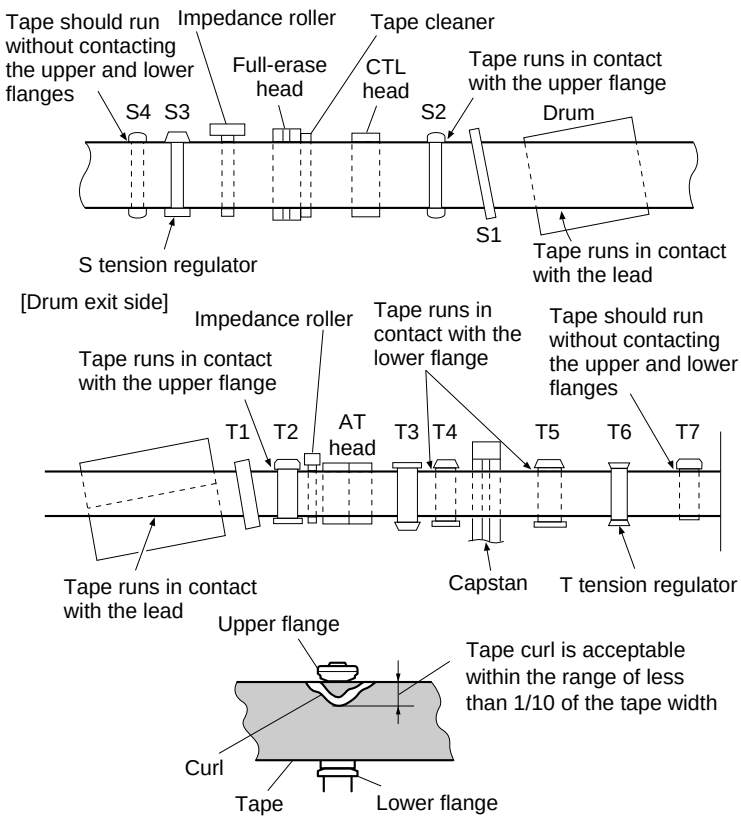
[Drum exit side]

- T2 guide
  Tape runs in contact with the upper flange.
- T3 guide (T drawer guide)
  Tape runs in contact with the lower flange.
  If tape curl occurs, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T4 and T5 guides
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.
- T6 guide (T tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T7 guide
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.

5. REV×1 mode check (At the beginning portion of the tape)

(1) Put the unit into the PLAY mode once, and press the Search button (the unit enters the search mode). And put the unit into REV×1 mode by turning the SHUTTLE dial.

(2) Check the tape running condition satisfies the specification 3.



Spec. 3: (REV×1 mode at the beginning portion of the tape)

[Drum entrance side]

- S2 guide
  Tape runs in contact with the upper flange.
- S3 guide (S tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If the tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- S4 guide
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.

[Drum exit side]

- T2 guide
  Tape runs in contact with the upper flange.
- T3 guide (T drawer guide)
  Tape runs in contact with the lower flange.
  If tape curl occurs, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T4 and T5 guides
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.
- T6 guide (T tension regulator guide)
  Tape runs without contacting the upper and lower flanges.
  If tape runs in contact with the upper or lower flange, tape curl is acceptable within the range of less than 1/10 of the tape width.
- T7 guide
  Tape runs without contacting the upper and lower flanges.
  Even if the tape runs in contact with the upper or lower flange, tape curl could not be acceptable.
  Tape should run in contact with the guide roller.

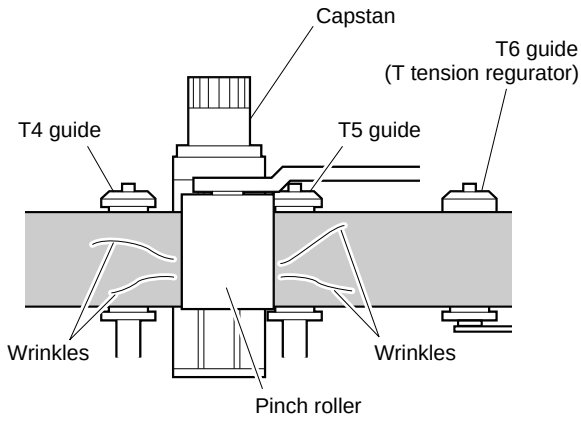
6. Tape running condition check around capstan shaft

(1) Put the unit into the REW mode at the end portion (50 min. to 60 min.) of the S cassette tape without lid (BCT-30MA). When the rewind speed is put into a uniform, change the mode from REW to F FWD.
Just as the mode was changed, check the tape running condition between T4 guide and capstan shaft, and between capstan shaft and T5 guide meet the specification 4.

(2) Repeat the step (1) three times, and check the tape running conditions meet the specification 4.
If not, perform step 7 and later.

(3) Put the unit into the F FWD mode at the end portion (50 min. to 60 min.) of the S cassette tape without lid (BCT-30MA). When the fast forward speed is put into a uniform, change the mode from F FWD to PLAY.
Just as the mode was changed, check the tape running condition between T4 guide and capstan shaft, and between capstan shaft and T5 guide meet the specification 4.

(4) Repeat the step (3) three times, and check the tape running conditions meet the specification 4.
If not, perform step 7 and later.



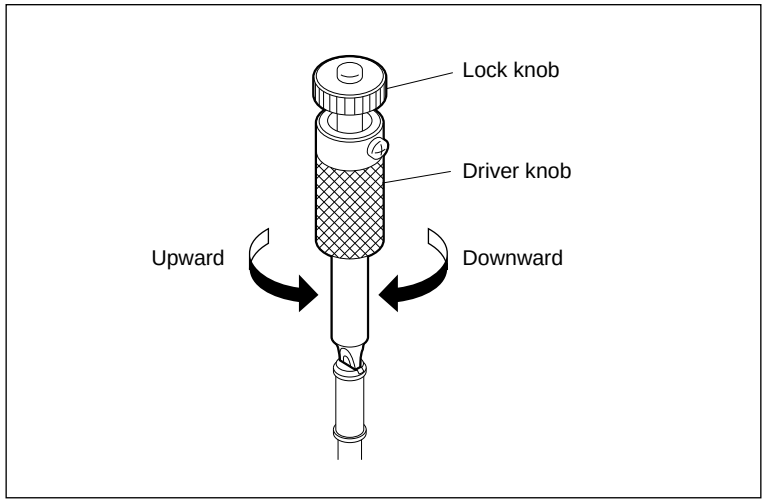
Spec. 4:
Tape runs without any wrinkle.
If the tape wrinkle occurs, check the tape wrinkle disappears within 1.5 second and do not damage the tape.

Adjustment procedure

7. Tape guide height adjustment

- In case that the tape tends to run on upper-end side with the unit switched from PLAY to REW;
  (1) Adjust T6 Guide (T tension regulator) by turning the upper flange 90 degrees clockwise and pressing it.
  (2) Check the tape running conditions (by performing the steps from 1 to 6.)
  (3) If the tape running conditions do not meet the specs 1 to 4, re-perform the tape guide height adjustment. (Do not exceed 180 degrees (twice 90 degrees) when turning the upper flange.)

- In case that the tape tends to run on lower-end side with the unit switched from PLAY to REW;
  (1) Adjust T6 Guide (T tension regulator) by turning the upper flange 90 degrees counterclockwise and pulling it.
  (2) Check the tape running conditions (by performing the steps from 1 to 6.)
  (3) If the tape running conditions do not meet the specs 1 to 4, re-perform the tape guide height adjustment. (Do not exceed 180 degrees (twice 90 degrees) when turning the upper flange.)



8. Recheck of tape running condition

Perform steps 1 through 6 again, and check the tape running conditions meet each specifications. If not, perform step 7 again.

In Case the Adjustment is Performed

9. Video tracking check and adjustment

(Refer to Section 5-5.)

10. CTL head position check and adjustment

(Refer to Section 5-7.)

11. AT head height check and adjustment

(Refer to Section 5-9.)

12. AT head azimuth check and adjustment

(Refer to Section 5-10.)

13. CTL head position check and adjustment

(Refer to Section 5-7.)

14. AT head position check and adjustment

(Refer to Section 5-8.)

Note

After check and adjustment are completed, be sure to set the switch S100-1 on the SV-206 board to OFF.

5-5. Video Tracking Check and Adjustment

Tools

- Alignment tape CR2-1B: 8-960-096-01
- Oscilloscope (Tektronix 2465B or equivalent)
- Inspection mirror: J-6080-840-A
- Tape guide adjustment driver: J-6322-420-A

Preparation

1. Turn the power off.

2. Remove the upper frame without disconnecting the harness connectors.

(Refer to the maintenance manual Part 1, step (1) to (4) in Section 1-6-2.)

3. Remove the cassette compartment.

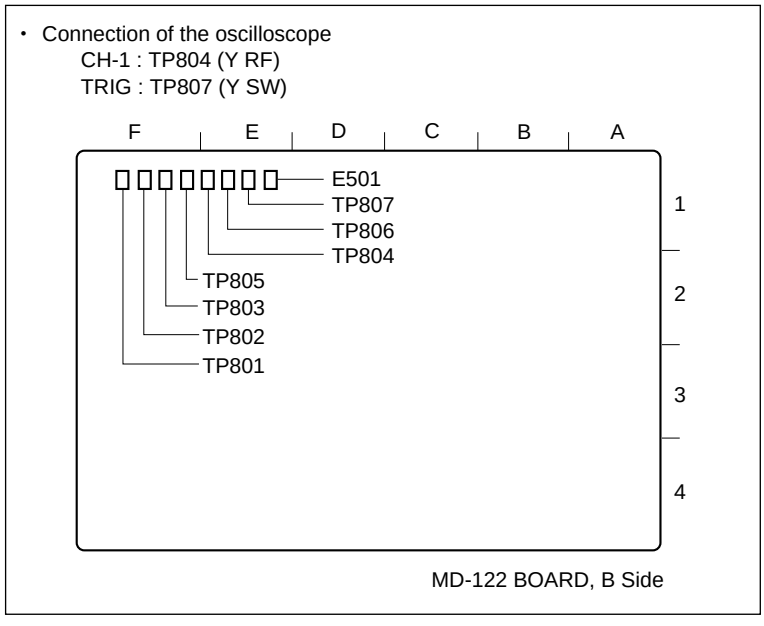
(Refer to the maintenance manual Part1 Section 1-7.)

4. Connect the oscilloscope.

CH-1 : TP804 (Y RF)/MD-122 board
TRIG : TP807 (Y SW)/MD-122 board
Oscilloscope setting:
CH-1 : 50 mV/DIV
TIME : 2 ms/DIV

5. Switch setting

Set the switch S100-1 (cassette compartment lock) on the SV-206 board to ON.



Check procedure

6. Turn the power on

7. Mode setting (REC head PB)

(1) Insert the CR2-1B into the unit.

(2) Press the PLAY button, and then press the any button of the ASSEMBLE button and/or INSERT buttons to establish the REC head PB mode.

Note

Ensure that the erasure prevention plug of the alignment cassette-tape is pressed in.

8. Check the CTL head height

(Refer to Section 5-6.)

Note

Be sure to check the CTL head position when the CTL head height is adjusted.

9. Tape rising pressure check (S side)

(1) Check that D109 LED on the SV-206 board is not light.

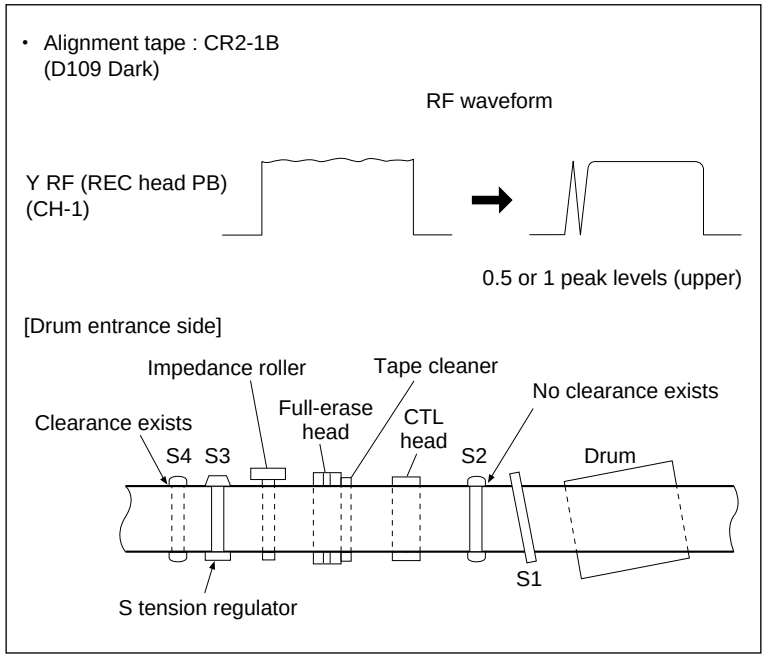
(2) Play back the CR2-1B.

(3) Turn the upper flange of the S2 guide counterclockwise using a tape guide adjustment driver so that 0.5 or 1 peak levels are appeared in an RF signal waveform as shown in the figure. At that time, check the following.

- Check that no clearance exists between the upper flange of S2 guide and upper edge of the tape.
- Check that clearance exists between the flanges (upper and lower) of S4 guide and the edges of the tape.

If they are not satisfied, perform the tape running adjustment (refer to Section 5-4) and video tracking adjustment (refer to steps 19 and later) to meet both specifications.

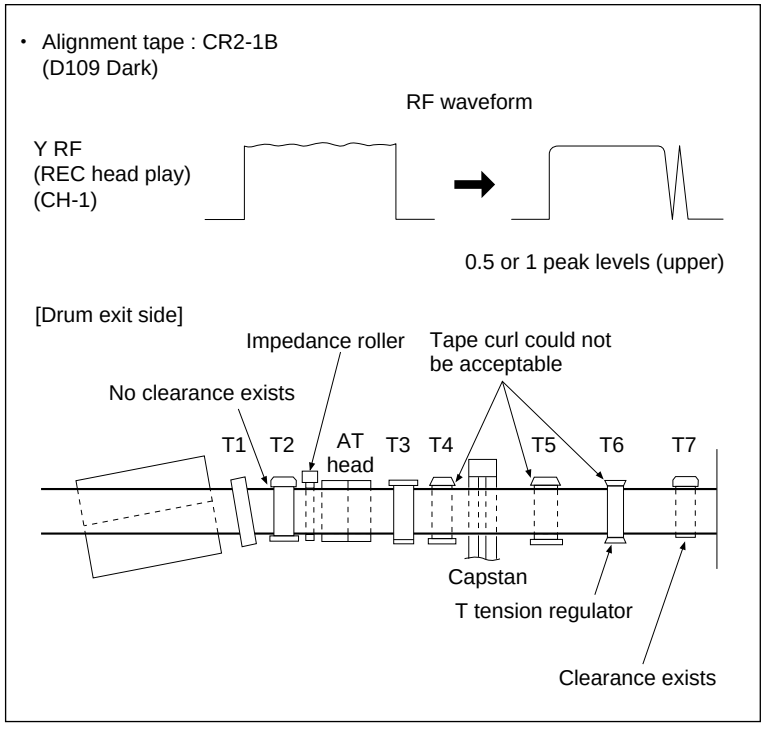
(4) Turn the upper flange of S2 guide clockwise so that the RF signal waveform is almost flat.



10. Tape rising pressure check (T side)

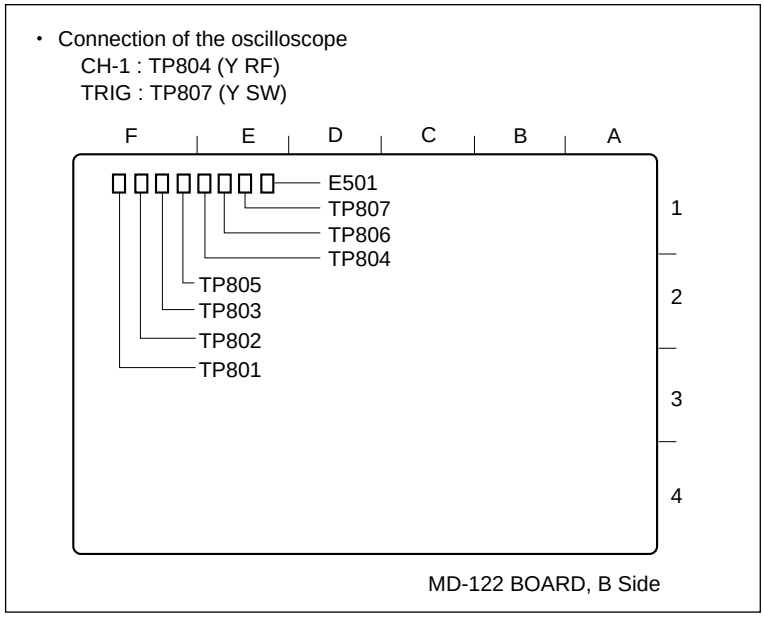
(1) Check that D109 LED on the SV-206 board is not light.
(2) Play back the CR2-1B.
(3) Turn the upper flange of the T2 guide counterclockwise using a tape guide adjustment driver so that 0.5 or 1 peak levels are appeared in an RF signal waveform as shown in the figure. At that time, check the followings.
- Check that no clearance exists between the upper flange of T2 guide and upper edge of the tape.
- Check that the tape runs without contacting the upper and lower flanges of the T4, T5, and T6 guides.
  If tape runs in contact with the upper or lower flanges of the T4, T5, and T6 guides, tape curl could not be acceptable.
- Check that clearance exists between the flanges (upper and lower) of T7 guide and the edges of the tape.

If they are not satisfied, perform the tape running adjustment (refer to Section 5-4) and video tracking adjustment (refer to steps 19 and later) to meet both specifications.
(4) Turn the upper flange of T2 guide clockwise so that the RF signal waveform is almost flat.
(5) Turn off S100-3 switch on the SV-206 board.



11. PLAY mode

(1) Connect the oscilloscope.
CH-1 : TP804 (Y RF)/MD-122 board
TRIG : TP807 (Y SW)/MD-122 board
Oscilloscope setting;
CH-1 : 50 mV/DIV
TIME : 2 ms/DIV
(2) Play back the CR2-1B.
(3) Press S101 switch on the SV-206 board more than 3 seconds so that the tracking VR becomes to be effective.



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(4) Turn the tracking VR (RV100) so that the output level of the center portion of RF envelope waveform is maximized.
(5) Turn the tracking VR (RV100) clockwise so that the center portion of the RF envelope waveform makes 80% of its maximum output level.
(6) At the state of (5), check that the RF envelope waveform satisfies specification 1.

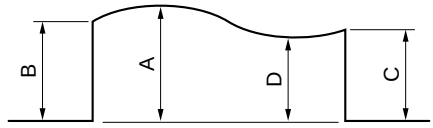
Note

If the level fluctuates, read the average level.

(7) If the level fluctuates, turn the tracking VR (RV100) on the SV-206 board so that the output level in the center portion of the RF envelope waveform is maximized, and check that the fluctuation amounts satisfy the specification 2.

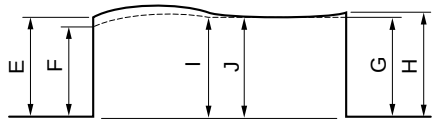
If specifications 1 and 2 are not satisfied, perform the adjustment (at the Drum Entrance Side or the Drum Exit Side) in steps 19 and later.

- Alignment tape : CR2-1B (D109 Lit)



Spec.1: The output level of the waveform should be more than 80 % of the maximum value.

$\frac{B}{A} \geqq 0.8$, $\frac{C}{A} \geqq 0.8$, $\frac{D}{A} \geqq 0.8$



Spec.2: The fluctuation value in each portion of a waveform should be less than 10 %.

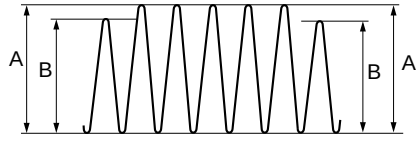
$\frac{F}{E} \geqq 0.9$, $\frac{G}{H} \geqq 0.9$, $\frac{I}{J} \geqq 0.9$

12. F. FWD and REV modes

(1) Press the PLAY button to play back the CR2-1B.
(2) Put the unit into the F. FWD×5 mode and check that the RF waveform satisfies the specification 3.
(3) Put the unit into the REV×5 mode and check that the RF waveform satisfies the specification 3.

If specification 3 is not satisfied in each mode, perform the adjustment (at the Drum Entrance Side or the Drum Exit Side) in steps 19 and later.

- Alignment tape : CR2-1B (D109 Dark)

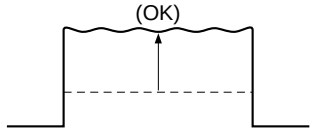


Spec. 3: $\frac{B}{A} \times 100 \geqq 80$ %

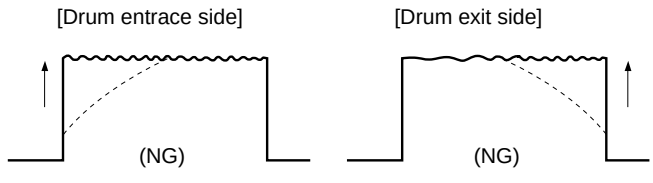
13. REV×10 mode to PLAY mode

(1) Press the PLAY button to play back the CR2-1B.
(2) Put the unit into the REV×10 mode once. Three seconds later, put the unit into the PLAY mode again.
Check that the RF envelope waveform returns to the maximum level with the even level. (Specification 4)
(3) Repeat changing the mode REV×10 to PLAY three times, check that the waveform satisfies the specification 4 on every time.

- Alignment tape : CR2-1B (D109 Dark)



Spec.4 Returning with even level.



14. Adjust the drum PG phase

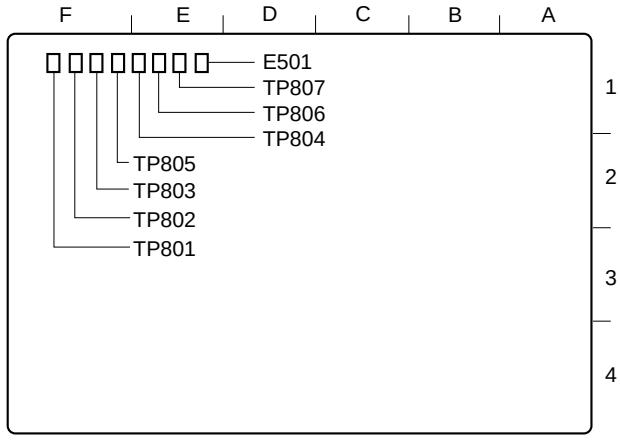
(Refer to Section 6-2-1.)

15. Check the PB head head-to-tape contact

(1) Turn the power off.
(2) Wait about three seconds and then turn the power on. The Rec head PB mode is released due to it.
(3) Connect the oscilloscope.
CH-1 : TP804 (Y RF)/MD-122 board
TRIG : TP807 (Y SW)/MD-122 board
CH-2 : TP805 (C RF)/MD-122 board
TRIG : TP806 (C SW)/MD-122 board
Oscilloscope setting:
CH-1 : 50 mV/DIV
CH-2 : 50 mV/DIV
TIME : 2 ms/DIV
(4) Play back the CR2-1B.
(5) Press S101 switch on the SV-206 board more than 3 seconds so that the tracking VR becomes to be effective.
(6) Turn the tracking VR so that the output level at the center portion of the RF waveform of a-channel is maximized. (CH-1)
(7) Check that the RF waveform of a-channel satisfies the specification 5. (CH-1)
(8) Maximize the output level of the RF waveform of b-channel by turning the tracking VR, check that the RF waveform of b-channel satisfies the specification 5. (CH-1)
(9) Change the connection of TRIG of the oscilloscope to TP806 on the MD-122 board and perform the check from procedures (6) through (8) in the same way. (CH-2)

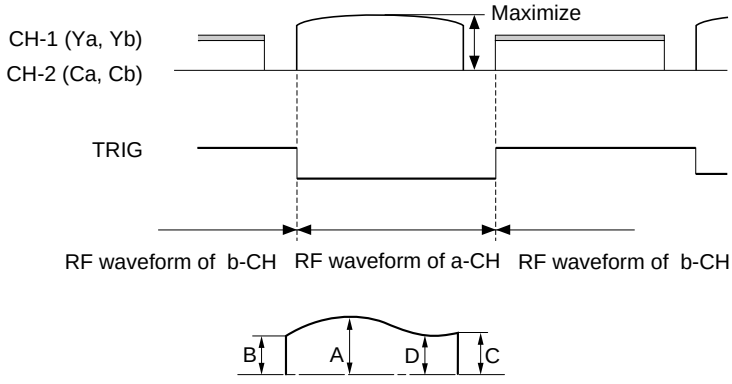
If the specification 5 is not met, perform the adjustment (at the Drum Entrance Side or the Drum Exit Side) in steps 19 and later.

• Connection of the oscilloscope
CH-1 : TP804 (Y RF) – TRIG : TP807 (Y SW)
CH-2 : TP805 (C RF) – TRIG : TP806 (C SW)



MD-122 BOARD, B Side

• Alignment tape : CR2-1B
(D109 Lit)



Spec. 5: The output level of the waveform should be more than 80 % of the maximum value.

$\frac{B}{A} \geqq 0.8$, $\frac{C}{A} \geqq 0.8$, $\frac{D}{A} \geqq 0.8$

16. Adjust the AT head position

(Refer to Section 5-8.)

17. Check the AT head height

(Refer to Section 5-9.)

Note

Be sure to check the AT head position when the AT head height is adjusted.

18. Check the AT head azimuth

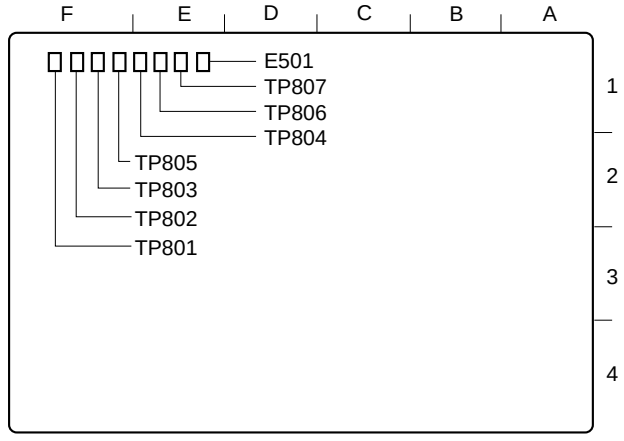
(Refer to Section 5-10.)

Adjustment procedure

19. Tracking adjustment on drum entrance side

(1) Put the unit into the Rec head PB mode. (Refer to the procedure 7)
(2) Connect the oscilloscope.
CH-1 : TP804 (Y RF)/MD-122 board
TRIG : TP807 (Y SW)/MD-122 board
Oscilloscope setting;
CH-1 : 50 mV/DIV
TIME : 2 ms/DIV
(3) Press S101 switch on the SV-206 board more than 3 second so that the tracking VR becomes to be effective.
(4) Play back the CR2-1B.
(5) Turn the tracking VR (RV100) so that the output level at the center portion of the RF envelope waveform is maximized.
(6) Turn the tracking VR (RV100) clockwise so that the center portion of the RF envelope waveform makes 80% of its maximum output level.
(7) Loosen the setscrew on the S2 guide and adjust the height of the S2 guide so that the envelope waveform satisfies the specifications 6 and 7.
(8) Tighten the setscrew on the S2 guide.
Tightening torque:
9×10^{-2} N•m {0.9 kgf•cm}
(9) Check that the clearance exists between the flanges (upper and lower) of S4 guide and the edges of the tape.
If it is not satisfied, perform the tape running adjustment (refer to Section 5-4) and this procedure to meet both specifications.

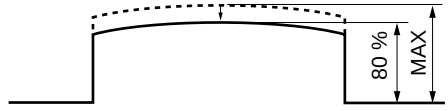
• Connection of the oscilloscope
CH-1 : TP804 (Y RF)
TRIG : TP807 (Y SW)

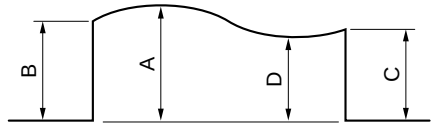


MD-122 BOARD, B Side

• Alignment tape : CR2-1B
(D109 Lit)

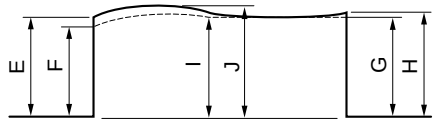
RF envelope waveform





Spec. 6: The output level of the waveform should be more than 80 % of the maximum value.

$\frac{B}{A} \geqq 0.80$, $\frac{C}{A} \geqq 0.80$, $\frac{D}{A} \geqq 0.80$



Spec. 7: The fluctuation value in each portion of a waveform should be less than 10 %.

$\frac{F}{E} \geqq 0.9$, $\frac{G}{H} \geqq 0.9$, $\frac{I}{J} \geqq 0.9$

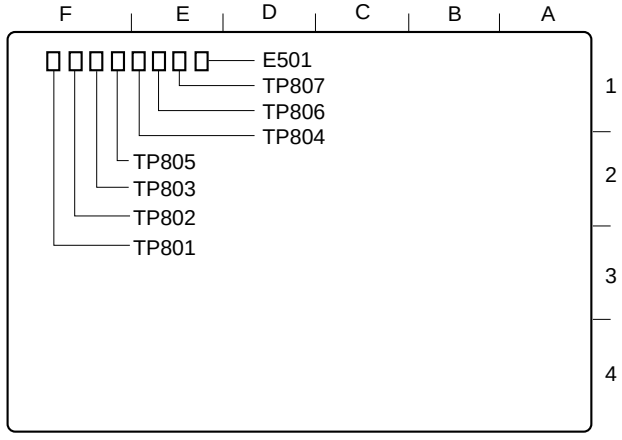
20. Tracking adjustment on drum exit side

(1) Put the unit into the Rec head PB mode.
(Refer to the procedure 7)
(2) Connect the oscilloscope.
CH-1 : TP804 (Y RF)/MD-122 board
TRIG : TP807 (Y SW)/MD-122 board
Oscilloscope setting;
CH-1 : 50 mV/DIV
TIME : 2 ms/DIV
(3) Press S101 switch on the SV-206 board more than three seconds to enable the tracking VR.
(4) Play back the CR2-1B.
(5) Turn the tracking VR (RV100) so that the output level at the center portion of the RF envelope waveform is maximized.
(6) Turn the tracking VR (RV100) clockwise so that the center portion of the RF envelope waveform makes 80% of its maximum output level.
(7) Loosen the setscrew on the T2 guide and adjust the height of the T2 guide so that the envelope waveform satisfies the specifications 8 and 9.
(8) Tighten the setscrew on the T2 guide.
Tightening torque:
9×10^{-2} N•m {0.9 kgf•cm}
(9) Check that the clearance exists between the flanges (upper and lower) of T7 guide and the edges of the tape.
If it is not satisfied, perform the tape running adjustment (refer to Section 5-4) and this procedure to meet both specifications.

Note

After adjustment are completed, be sure to set S100-1 switch to OFF position.

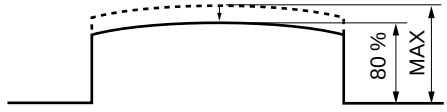
• Connection of the oscilloscope
CH-1 : TP804 (Y RF)
TRIG : TP807 (Y SW)

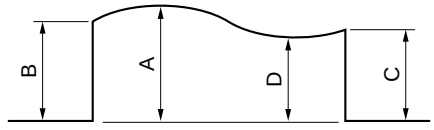


MD-122 BOARD, B Side

• Alignment tape : CR2-1B
(D109 Lit)

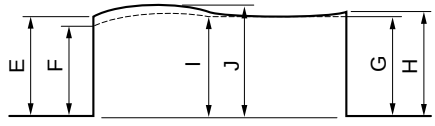
RF envelope waveform





Spec. 8: The output level of the waveform should be more than 80 % of the maximum value.

$$\frac{B}{A} \geqq 0.80 \quad , \quad \frac{C}{A} \geqq 0.80 \quad , \quad \frac{D}{A} \geqq 0.80$$



Spec. 9: The fluctuation value in each portion of a waveform should be less than 10 %.

$$\frac{F}{E} \geqq 0.9 \quad , \quad \frac{G}{H} \geqq 0.9 \quad , \quad \frac{I}{J} \geqq 0.9$$

5-6. CTL Head Height Check and Adjustment

Tools

- Alignment tape CR8-1A: 8-960-097-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Nutdriver (d = 4.5 mm): 7-700-751-01

Preparation

1. Turn the power off

2. Connect the oscilloscope

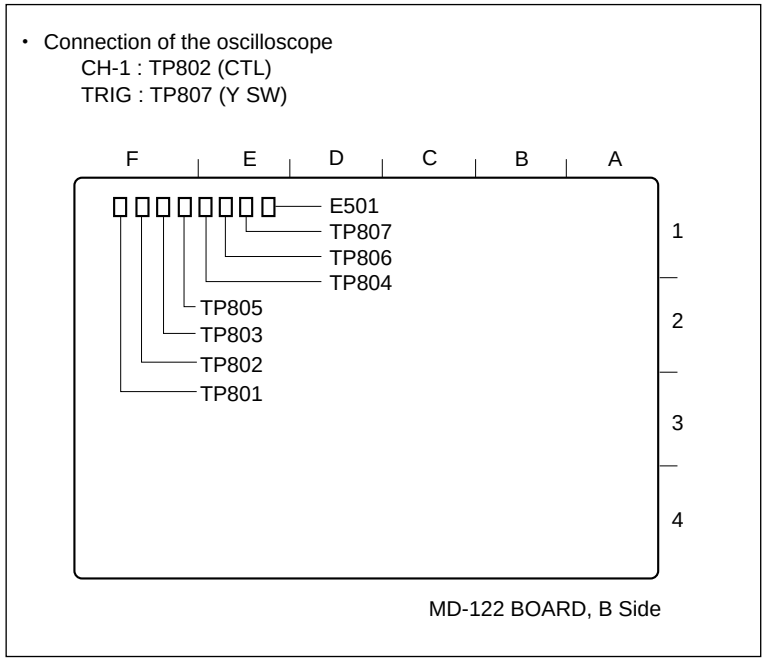
CH-1 : TP802 (CTL)/MD-122 board
TRIG : TP807 (Y SW)/MD-122 board
Oscilloscope setting :
CH-1 : 2 V/DIV
TIME : 5 ms/DIV

3. Switch setting

Set the switch S100-1 (cassette compartment lock) on the SV-206 board to ON.

4. Set the alignment tape

Set the CR8-1A and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Check procedure

5. Turn the power on

6. Play back the alignment tape

Play back the CR8-1A.

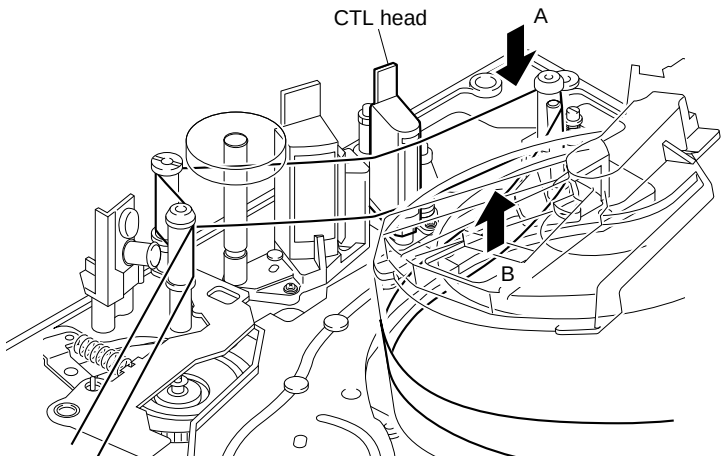
7. Check the CTL head height

(1) Check that the level decreases when portion A of the tape shown in the figure is pressed down.

If the level increases, perform step 8.

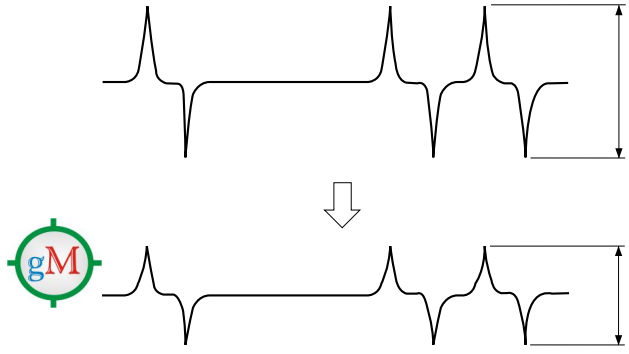
(2) Check that the level decreases when portion B of the tape is pushed up.

If the level increases, perform step 9.



• Alignment tape : CR8-1A

<CTL output waveform>



Spec.: The level decreases when pressing down and pushing up the alignment tape.

Adjustment procedure

8. In case the level increases when the tape is pressed down

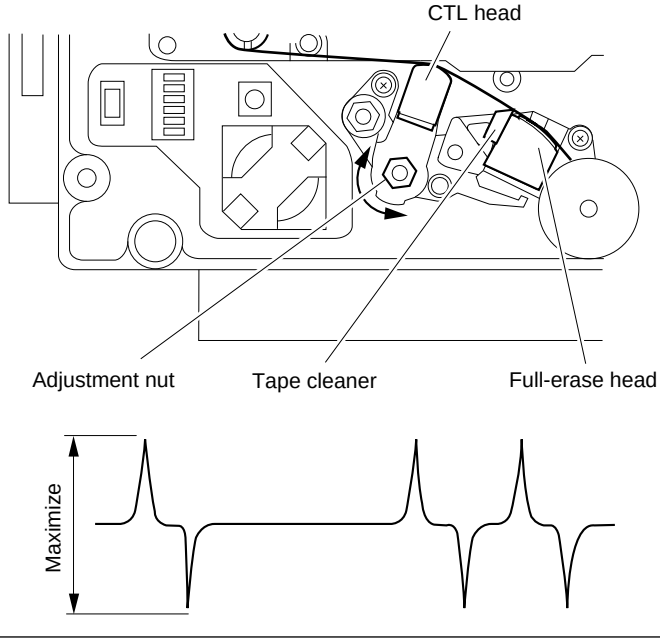
Turn the adjustment nut counterclockwise and adjust so that the output waveform is maximum.
And at that time, check the output level is 5 Vp-p or more.

9. In case the level increases when the tape is pushed Up

Turn the adjustment nut clockwise and adjust so that the output waveform is maximum.
And at that time, check the output level is 5 Vp-p or more.

Note

After adjustment are completed, be sure to set S100-1 switch to OFF position.



5-7. CTL Head Position Check and Adjustment

Note

The CTL head position adjustment is closely related to the AT head position adjustment.
Be sure to check the AT head position when the CTL head position is adjusted.

Tools

- Alignment tape CR2-1B: 8-960-096-01
- Oscilloscope (Tektronix 2465B or equivalent)
- Nutdriver (d = 4.5 mm): 7-700-751-01

Preparation

1. Turn the power off

2. Connect the oscilloscope

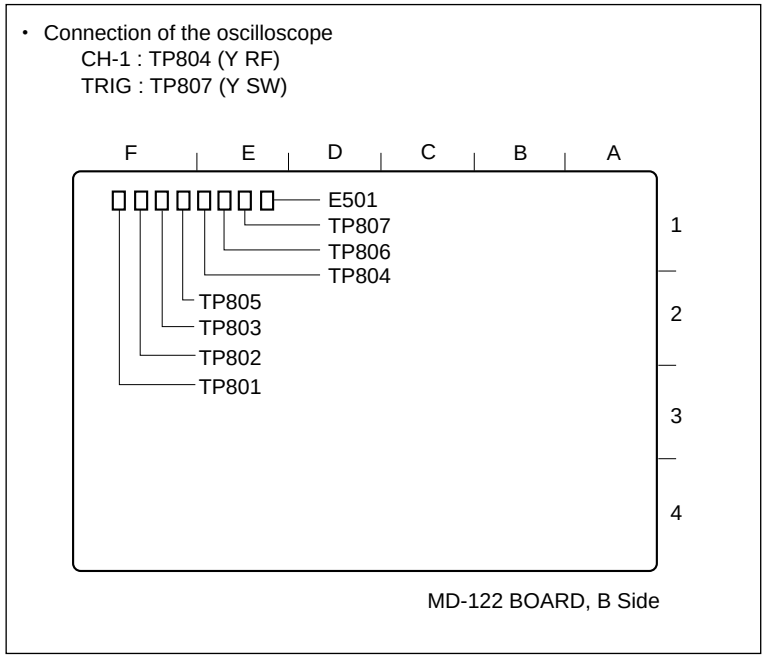
CH-1 : TP804 (Y RF)/MD-122 board
TRIG : TP807 (Y SW)/MD-122 board
Oscilloscope setting :
CH-1 : 1 V to 200 mV/DIV
TRIG : 5 V/DIV
TIME : 5 ms/DIV

3. Switch setting

Set the switch S100-1 (cassette compartment lock) on the SV-206 board to ON.

4. Set the alignment tape

Set the CR2-1B and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Check procedure

5. Turn the power on

6. Mode setting (REC head PB)

(1) Insert the CR2-1B into the unit.

(2) Press the PLAY button, and then press the any button of the ASSEMBLE button and/or INSERT buttons to establish the REC head PB head PB mode.

Note

Ensure that the erasure prevention plug of the alignment cassette-tape is pressed in.

7. Play back the alignment tape

Play back the CR2-1B.

8. Check the CTL head position

(1) Push S101 switch on the SV-206 board more than three seconds to enable the tracking VR.

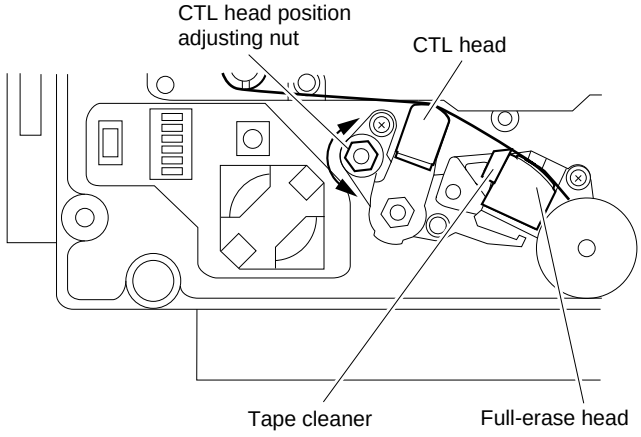
(2) Turn RV100 (tracking VR) on the SV-206 board so that the output level at the center portion of the RF envelope waveform is maximum and read the maximum level as Lv.

(3) Push S101 switch on the SV-206 board more than 3 sec. to fix the tracking VR.

(4) Read the output level at the center portion of the RF envelope waveform as LF.

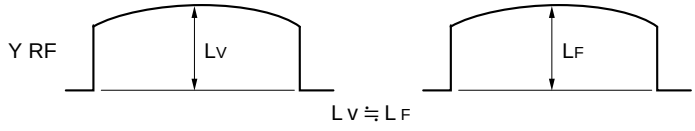
(5) Check that the levels Lv (readout by step (2)) and LF (readoout step (4)) satisfy the specification 1.

If the specification is not satisfied, perform steps 9 and later.



• Alignment tape : CR2-1B

(Tracking control : Effective state) (Tracking control : Non effective state)



Lv ≒ LF

Spec.1: When the tracking VR is not effective, the output level at the center portion of the RF envelope waveform (LF) is equal to the maximum output level (Lv) under the state of the tracking is effective.

Adjustment procedure

Note

Perform the adjustment described below under the state of the tracking VR is not effective.

9. Adjust the CTL head position

Turn the CTL head position adjusting nut using nutdriver so that the output level at the center portion is maximum.

10. Recheck the CTL head position

Perform to steps 6 through 8 again.

11. Check the CTL head height

(Refer to Section 5-6.)

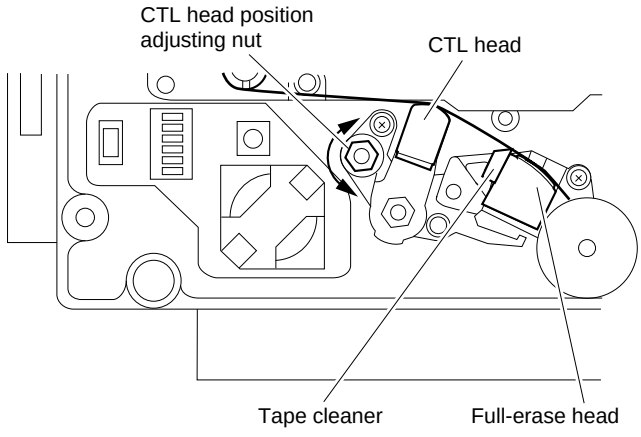
In Case the Adjustment is Performed

12. Adjust the AT head position

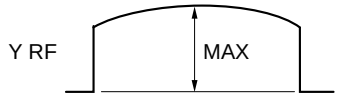
(Refer to Section 5-8.)

Note

After adjustment are completed, be sure to set S100-1 switch on the SV-206 board to OFF position.



- Alignment tape : CR2-1B
  (D109 Lit)



5-8. AT Head Position Check and Adjustment

Notes

- The CTL head position adjustment should be completed before performing this adjustment. The AT head position is adjusted with the CTL head position as a reference.
- The AT head position adjustment is closely related to the head height adjustment, and head azimuth adjustment.
  Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head position is adjusted.

Tools

- Alignment tape CR2-1B: 8-960-096-01
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the power off

2. Connect the oscilloscope

CH-1 : TP803 (LTC)/MD-122 board
CH-2 : TP801 (CTL P)/MD-122 board
TRIG : TP807 (Y SW)/MD-122 board
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 5 ms to 500 μs/DIV

3. Switch setting

Set the switch S100-1 (cassette compartment lock) on the SV-206 board to ON.

4. Set the alignment tape

Set the CR2-1B and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope
  CH-1 : TP803 (LTC)
  CH-2 : TP801 (CTL P)
  CH-3 : TP807 (Y SW)

MD-122 BOARD, B Side

Check procedure

5. Turn the power on

6. Play back the alignment tape

Play back the CR2-1B.

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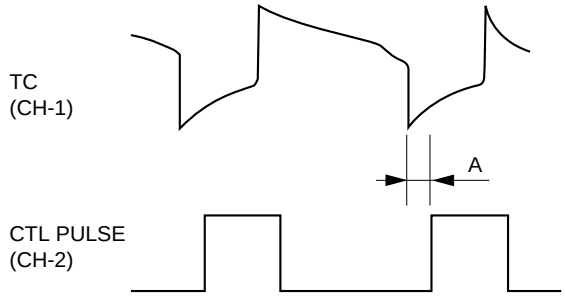
7. Check the AT head position

Check that the positional relationship between the rising edges of CTL and PB TC waveform signals satisfies the specification.

If the specification is not satisfied, perform steps 8 and later.

- Alignment Tape: CR2-1B



Spec. : A = 0 ±400µs

Adjustment procedure

8. Loosen the screws

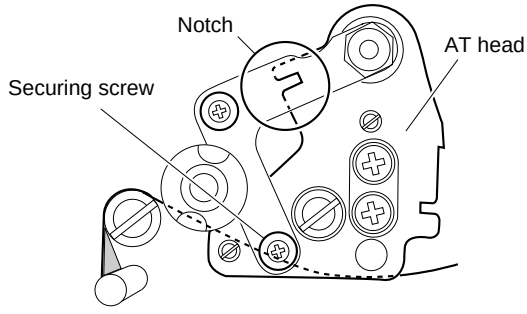
Loosen the securing screw shown in the figure by a turn.

9. Adjust the AT head position

(1) Insert a 2 mm flatbladed screwdriver into the notch of the AT head assembly.
(2) Adjust the AT head assembly position so that the specification is satisfied.

10. Tighten the screws

Tighten the screw loosened in step 8.
Tightening torque:
9×10^{-2} N•m {0.9 kgf • cm}



11. Recheck the AT head position

Refer to steps 6 and 7 in this section.

In Case the Adjustment is Performed

12. Check the AT head height

(Refer to Section 5-9.)

13. Check the AT head azimuth

(Refer to Section 5-10.)

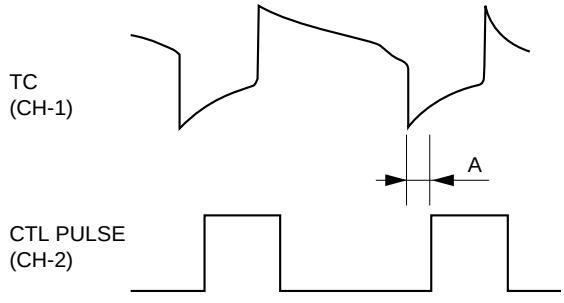
14. Check the AT head head-to-tape contact

(Refer to Section 5-11.)

15. Check the AT head position

Refer to steps 6 and 7 in this section.

- Alignment Tape: CR2-1B



Spec. : A = 0 ±400µs

Note

After adjustment are completed, be sure to set S100-1 switch on the SV-206 board to OFF position.

5-9. AT Head Height Check and Adjustment

Note

The AT head height adjustment is closely related to the azimuth adjustment, and head position adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head height is adjusted.

Tools

- Alignment tape CR8-1A: 8-960-097-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Nutdriver (d = 4.5 mm): 7-700-751-01

Preparation

1. Turn the power off

2. Connect the oscilloscope

CH-1 : TP303 (CH1 PB SIG)/AU-262 board
CH-2 : TP403 (CH2 PB SIG)/AU-262 board
TRIG : TP807 (Y SW)/MD-122 board
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV

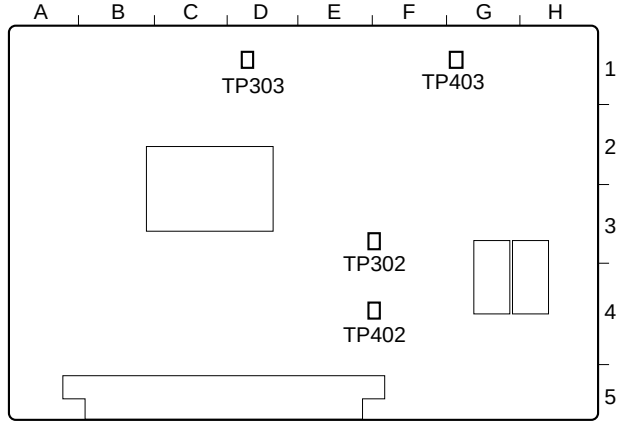
3. Switch setting

Set the switch S100-1 (cassette compartment lock) on the SV-206 board to ON.

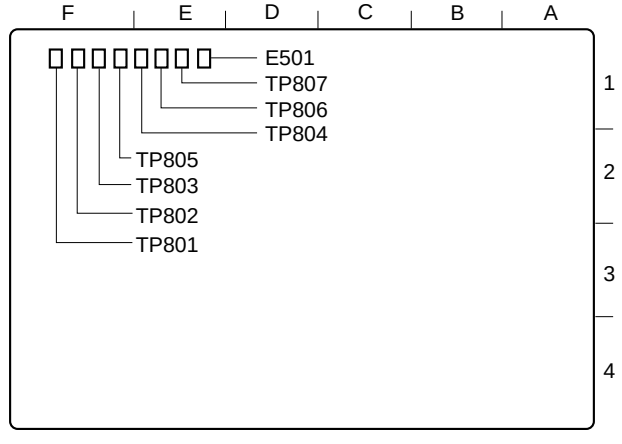
4. Set the alignment tape

Set the CR8-1A and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of th oscilloscope
  CH-1 : TP303 (CH1 PB SIG)/AU-262 board
  CH-2 : TP403 (CH2 PB SIG)/AU-262 board
  TRIG : TP807 (Y SW)/MD-122 board



AU-262 BOARD, A Side



MD-122 BOARD, B Side

Check procedure

5. Turn the power on

6. Play back the alignment tape

Play back the 1 kHz, 0 VU signal portion (8:00 to 10:00) on the CR8-1A.

7. Check the AT head height

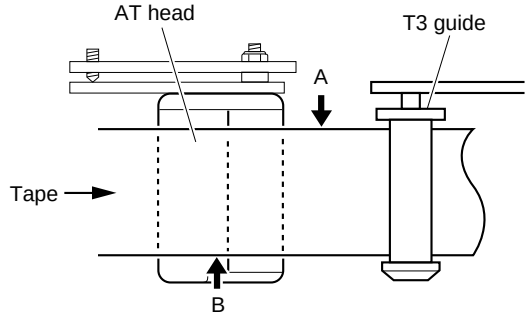
(1) Check that both levels in CH-1 and CH-2 decrease when portion A of the tape shown in the figure is pressed down.

If both levels increase, perform step 8.

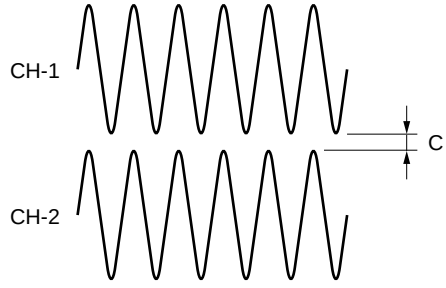
(2) Check that both levels in CH-1 and CH-2 decrease when portion B of the tape is pushed up.

If both levels increase, perform step 9.

• Alignment tape : CR8-1A (8:00 to 10:00)



<Audio output waveform>



Spec. : The portion C widens when pressing down and pushing up the alignment tape.

Adjustment procedure

8. In case both levels increase when the tape is pressed down (Fig. 1)

Turn the height adjustment nut counterclockwise so that both output waveforms in CH-1 and CH-2 are maximum.

9. In case both levels increase when the tape is pushed up (Fig. 2)

Turn the height adjustment nut clockwise and adjust so that both output waveforms in CH-1 and CH-2 are maximum.

In Case the Adjustment is Performed

10. Adjust the AT head azimuth

(Refer to Section 5-10.)

11. Adjust the AT head head-to-tape contact

(Refer to Section 5-11.)

12. Adjust the AT head position

(Refer to Section 5-8.)

13. Recheck the AT head height

(Refer to steps 6 and 7 in this section.)

14. Re-check the AT head

Perform the steps 10 and 12 again.

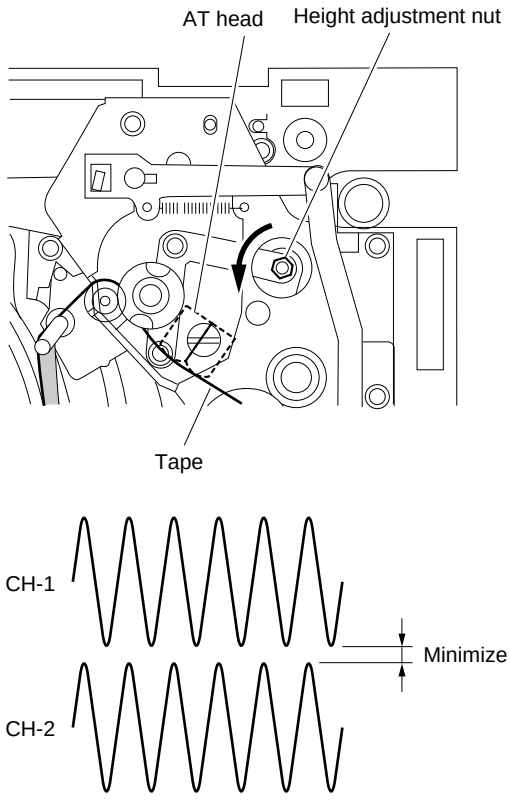
15. Locking compound applying

(Refer to Section 5-1.)

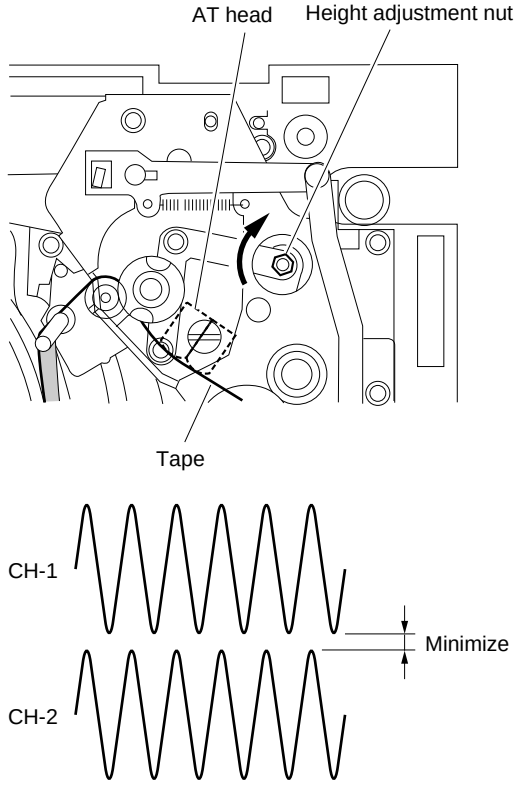
Note

After adjustment are completed, be sure to set S100-1 switch on the SV-206 board to OFF position.

<Fig.1>



<Fig.2>



5-10. AT Head Azimuth Check and Adjustment

Note

The AT head azimuth adjustment is closely related to head position adjustment and head height adjustment.
Be sure to perform adjustments (or checks) according to “In Case the Adjustment is Performed” in this section when the AT head azimuth is adjusted.

Tools

- Alignment tape CR8-1A: 8-960-097-45
- Oscilloscope (Tektronix 2465B or equivalent)

Preparation

1. Turn the power off

2. Connect the oscilloscope

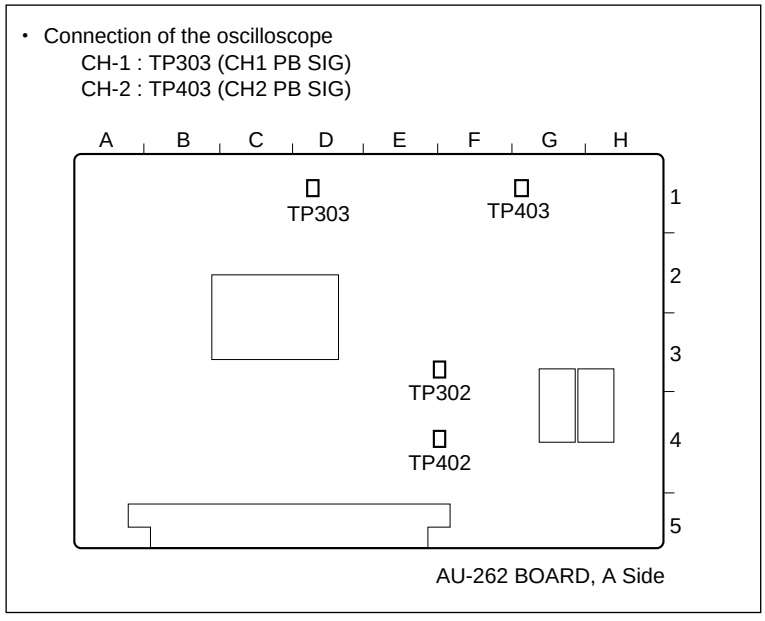
CH-1 : TP303 (CH1 PB SIG)/AU-262 board
CH-2 : TP403 (CH2 PB SIG)/AU-262 board
Oscilloscope setting :
CH-1 : 50 mV/DIV
CH-2 : 50 mV/DIV
MODE : X-Y

3. Switch setting

Set the switch S100-1 (cassette compartment lock) on the SV-206 board to ON.

4. Set the alignment tape

Set the CR8-1A and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.



Check procedure

5. Turn the power on

6. Play back the alignment tape

Play back the 10 kHz, -10 VU signal portion (3:00 to 4:55) on the CR8-1A.

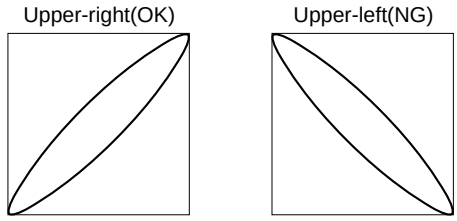
7. Check the AT head azimuth

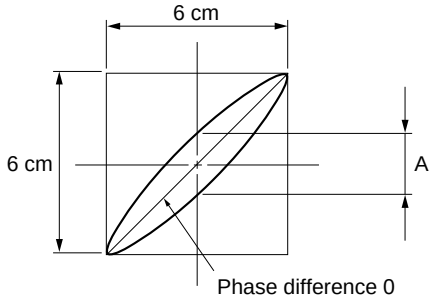
(1) Adjust the horizontal and vertical amplitudes of lissajous waveform to 6 cm each.
(2) Check that the lissajous waveform holds the upper-right shape.
(3) Check that the vertical amplitude at the center point in the horizontal direction satisfies the specification.
(4) Repeat changing the mode STOP to PLAY three times, check that the waveform satisfies the specification on every PLAY mode.
(5) Repeat changing the mode REW to PLAY three times, check that the waveform satisfies the specification on every PLAY mode.
(6) Repeat changing the mode EJECT to PLAY three times, check that the waveform satisfies the specification on every PLAY mode.

If the specification is not satisfied in any steps (3), (4), (5) or (6), perform steps 8 and later.

- Alignment tape : CR8-1A (3:00 to 4:55)

<Lissajous waveform>





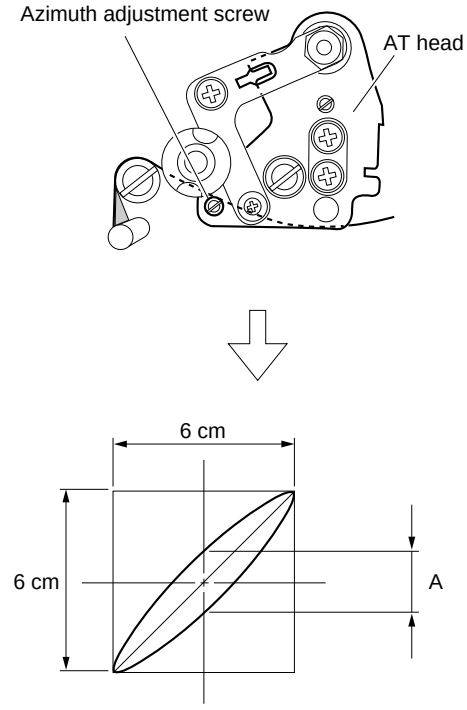
Spec. : A ≦ 0.52 cm

Adjustment procedure

8. Adjust the AT head azimuth

Turn the azimuth adjustment screw so that the specification is satisfied.

- Alignment tape : CR8-1A (3:00 to 4:55)



Spec. A ≦ 0.52 cm

In Case the Adjustment is Performed

9. Adjust the AT head head-to-tape contact

(Refer to Section 5-11.)

10. Adjust the AT head position

(Refer to Section 5-8.)

11. Check the AT head height

(Refer to Section 5-9.)

12. Check the AT head azimuth

(Refer to steps 6 and 7 in this section.)

13. Re-check the AT head

(Rerform the steps 9 and 10 again.)

14. Locking compound applying

(Refer to Section 5-1.)

Note

After adjustment are completed, be sure to set S100-1 switch on the SV-206 board to OFF position.

5-11. AT Head Head-to-tape Contact Check

Tools

- Alignment tape CR8-1A: 8-960-097-45
- Oscilloscope (Tektronix 2465B or equivalent)
- Bamboo stick

Preparation

1. Turn the power off

2. Connect the oscilloscope

CH-1 : TP303 (CH1 PB SIG)/AU-262 board
CH-2 : TP403 (CH2 PB SIG)/AU-262 board
TRIG : TP807 (Y SW)/MD-122 board
Oscilloscope setting :
CH-1 : 200 mV/DIV
CH-2 : 200 mV/DIV
TIME : 1 ms/DIV

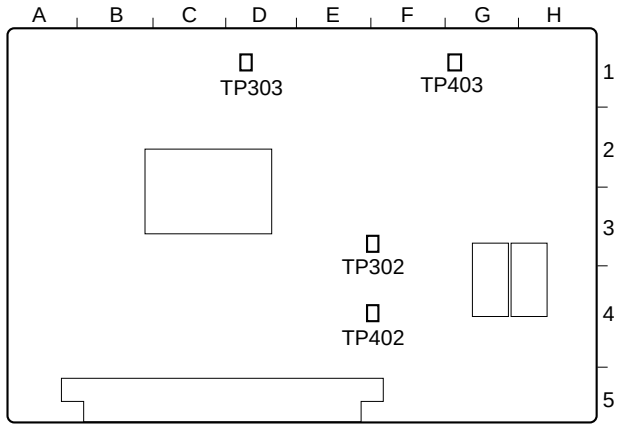
3. Switch setting

Set the switch S100-1 (cassette compartment lock) on the SV-206 board to ON.

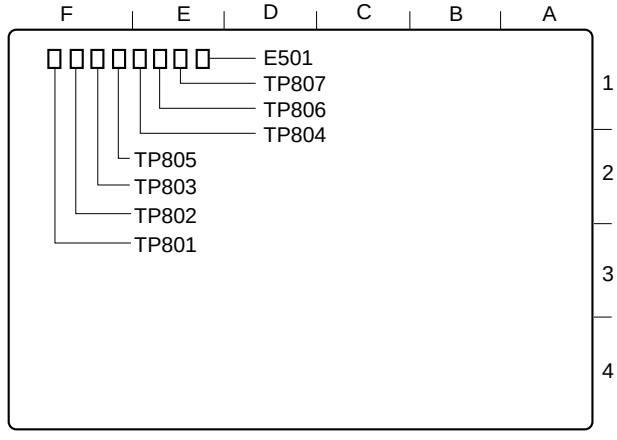
4. Set the alignment tape

Set the CR8-1A and put a weight on the cassette so that it does not rise up.
Weight about 1000 g is suitable.

- Connection of the oscilloscope
  CH-1 : TP303 (CH1 PB SIG)/AU-262 board
  CH-2 : TP403 (CH2 PB SIG)/AU-262 board
  TRIG : TP807 (Y SW)/MD-122 board



AU-262 BOARD, A Side



MD-122 BOARD, B Side

Check procedure

5. Turn the power on

6. Play back the alignment tape

Play back the 10 kHz, -10 VU signal portion (3:00 to 4:55) on the CR8-1A.

7. Check the AT head head-to-tape contact

(1) Push portions A and B of the tape shown in the figure slightly. (It means increasing the tape's wrapping angle against the AT head.)

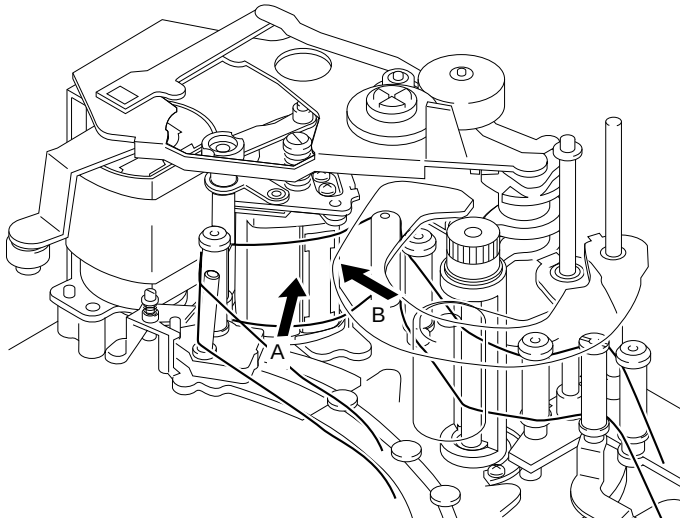
(2) Check that both increasing values of the output levels in CH-1 and CH-2 satisfy the specification.

If the specification is not satisfied, perform the AT head removal and installation again. (Refer to Section 3-15.)

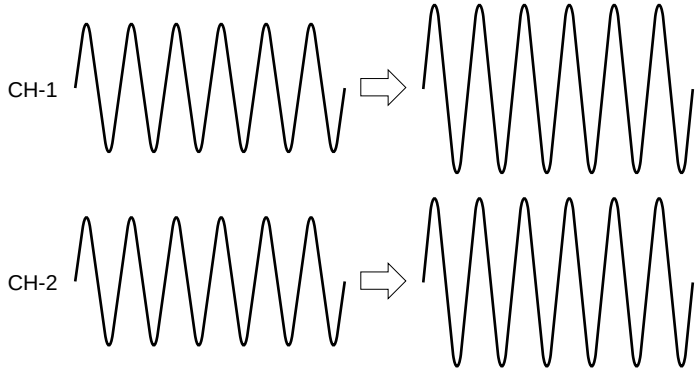
Note

After adjustment are completed, be sure to set S100-1 switch on the SV-206 board to OFF position.

• Alignment tape : CR8-1A (3:00 to 4:55)



<AUDIO output waveform>



Spec. : Both increasing values of the output levels in CH-1 and CH-2 are within 5%.

http://getMANUAL.com

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